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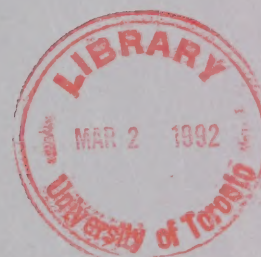
VOLUME: 354

DATE: Wednesday, February 19, 1992

BEFORE:

A. KOVEN. Chairman

E. MARTEL Member



FOR HEARING UPDATES CALL (COLLECT CALLS ACCEPTED) (416)963-1249

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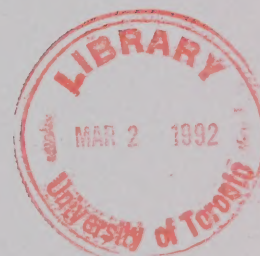
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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental
Assessment for Timber Management on Crown
Lands in Ontario;

- and -

IN THE MATTER of a Notice by The Honourable
Jim Bradley, Minister of the Environment,
requiring the Environmental Assessment
Board to hold a hearing with respect to a
Class Environmental Assessment (No.
NR-AA-30) of an undertaking by the Ministry
of Natural Resources for the activity of
Timber Management on Crown Lands in
Ontario.

Hearing held at the offices of the Ontario
Highway Transport Board, Britannica Building,
151 Bloor Street West, 10th Floor, Toronto,
Ontario, on Wednesday, February 19th, 1992,
commencing at 9:00 a.m.

Volume 354

BEFORE:

MRS. ANNE KOVEN
MR. ELIE MARTEL

Chairman
Member

A P P E A R A N C E S

MR. V. FREIDIN, Q.C.)	MINISTRY OF NATURAL
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MR. R. COSMAN)	ASSOCIATION and ONTARIO
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MR. M. BAEDER)	and WINDIGO TRIBAL COUNCIL
MS. M. SWENARCHUK)	FORESTS FOR TOMORROW
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MR. P.D. McCUTCHEON	GEORGE NIXON
MR. C. BRUNETTA	NORTHWESTERN ONTARIO TOURISM ASSOCIATION

I N D E X O F P R O C E E D I N G S

Witness:

Page No.

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I N D E X O F E X H I B I T S

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
2107	Document entitled Research on Wildlife in Old-Growth Forests: Setting the Stage, authored by Dr. Thomas, dated May 1991.	61727
2108	Document entitled Research on Wildlife in-Old Growth Forests: An Attempt at Perspective, authored by Dr. Thomas, dated May 1991.	61748

1 ---Upon commencing at 9:00 a.m.

2 MADAM CHAIR: Good morning. Please be
3 seated.

4 Good morning, Mr. O'Leary.

5 MR. O'LEARY: Good morning, Madam Chair,
6 Mr. Martel.

7 JEFF PATCH,
8 JACK WARD THOMAS,
RICK PAGE, Resumed.

9 CONTINUED DIRECT EXAMINATION BY MR. O'LEARY:

10 Q. Dr. Thomas, we are now turning to the
11 subheading Need for Training in the witness statement
12 which starts at page 22.

13 What I would like to do is refer you,
14 first of all, to your paper under Tab 15 of the witness
15 statement, page Roman numeral (xxiii) and in the
16 beginning of the second full paragraph you state:

17 "We must ensure, therefore, that
18 currently practising wildlife biologists
19 receiving the training necessary to
20 understand the advantages and limitations
21 of modelling and how to play the game in
22 a world of modellers and planners."

23 Can I ask you, since this paper was
24 written in 1984 have you changed your opinion or do you
25 still hold the same view?

1 DR. THOMAS: A. I still hold the same
2 view. In fact, it has been strengthened since that
3 time.

4 Q. In your experience as an adjunct
5 professor and in your dealing with graduate students,
6 as you described earlier in your evidence, can you tell
7 me whether you have formed an opinion as to the extent
8 of the students you have met acquiring skills in the
9 use of computer prior to their departure from
10 universities and colleges in the United States?

11 A. Most Bachelor degrees graduates are
12 computer literate and certainly those that are coming
13 out of graduate school, and most of the people that we
14 hire have Master's degrees, the vast majority are quite
15 computer literate and familiar with modelling and think
16 in such terms.

17 Q. All right. Does this skill have any
18 significance in terms of their ability to deal with and
19 use HSA models?

20 A. It's not only HSA. They can use HSA
21 models, but not only that, they are quite conversant
22 with modelling and as that's the format of all of our
23 planning operations of judging interactions and joint
24 production functions they are quite capable of dealing
25 in that arena.

1 Q. Mr. Patch indicates in his witness
2 statement and spoke to it earlier at one point in his
3 examination-in-chief that in New Brunswick certain
4 persons are uncomfortable in being forced to explicitly
5 define the assumptions underlining their professional
6 judgments which is a requirement, of course, of HSA
7 modelling.

8 Can I ask what your experience is in the
9 United States?

10 A. Quite similar in the sense that in
11 the past our biologists grew up with the idea that
12 their function in life when they were dealing totally
13 with timber management planning was to do the best they
14 could to protect wildlife interests when those plans
15 were formulated and when the actions were carried out.

16 As a result, they were mostly in an
17 adversarial role of saying: Don't do this, don't do
18 that, which was wearing everybody out. This has
19 allowed them to go into a proactive role where we deal
20 with joint production and they are able to express very
21 explicitly what they want.

22 That has been a great step forward from
23 moving from being constrained, from being somebody who
24 was always saying: No, or look out or watch out, to
25 saying: How do we operate together to produce the

1 joint products.

2 Q. Can I ask you, in United States
3 whether or not this phenomenon of uncomfortableness had
4 any delay impact or any negative impact on the
5 implementation of HSA?

6 A. Yes, I think so particularly not just
7 HSA, but essentially in our first round of planning,
8 which is just now being finished which should have
9 taken five years but took considerably longer, I think
10 a considerable portion of that delay was not only
11 involved with wildlife biologists, but with foresters
12 and others who were not prepared to deal in that
13 modelling mode.

14 That's since been rectified and we move
15 much more rapidly now.

16 Q. Thank you. If I could turn you now
17 to your paper, Dr. Thomas, behind Tab 18 of the witness
18 statement. Can I first ask you when and where this
19 paper was prepared and published?

20 A. This is the introduction to -- I
21 don't remember the exhibit, but it is Wildlife Habitats
22 in Managed Forests that was presented some time
23 previous in this week as an exhibit. It is the
24 introductory chapter. It was prepared in 1976,
25 published in 1979.

1 Q. That's Exhibit 2101.

2 Q. Can you tell us, Dr. Thomas, what is
3 the relevance of this paper to this proceeding?

4 A. In essence it should very clearly
5 describe our first step at being able to integrate
6 wildlife habitat management and forest management.

7 Yesterday, Madam Chair, I referred to
8 page 14 of this document. I said I would look it up
9 over the evening which indicates that foresters and
10 wildlife biologists are certainly trained in the same
11 science. Certainly trained to think about the same
12 things.

13 Unfortunately, we use different
14 terminology for it and this graph on page 14 indicates
15 how that works. But essentially it is the introductory
16 chapter. It describes exactly what the need for being
17 able to deal with information basic to habitat
18 modelling and projection and why we did it and how we
19 did it. It's the introduction, of course, to the rest
20 of the book.

21 Q. All right. Could I ask you to go to
22 page 10 of that paper, Dr. Thomas. I am looking at the
23 third full paragraph halfway down -- well, the full
24 paragraph where you state:

25 "The setting is the Blue Mountains of

1 Oregon and Washington, but it could be
2 anywhere North America where coniferous
3 forests are a dominant part of the
4 landscape and where public ownership of
5 forest land is extensive. Although the
6 setting is geographically narrow, the
7 general concepts, principles and
8 practises are applicable to forest
9 management throughout the country."

10 Can I ask you to elaborate on that
11 comment and particularly the last sentence in terms of
12 the transferability of the general concepts, principles
13 and practises to which you discuss in the paper?

14 A. When we wrote this in 1976 we assumed
15 that to be the case. Not the specifics, but the
16 general overall principles could be shifted.

17 Since that time this has become a
18 national program in the U.S. Forest Service. Similar
19 documents are now available for Sierra, Nevada and
20 California, for southwestern coniferous forests, for
21 the deciduous forests of the northeastern United States
22 and being brought to bear across the board in the U.S.
23 Forest Service.

24 So that prophecy turned out to be true.
25 The general principles are applicable. The details

1 have to be described for each individual situation.

2 Q. Do you have a view as to whether or
3 not that statement would be applicable in respect of
4 other jurisdictions outside of the United States?

5 A. The system has been -- there is a
6 counterpart effort in Germany, the Indian government is
7 beginning to use it, British Columbia picked up on it,
8 New Brunswick has picked up on it. So I think that
9 demonstrates its applicability.

10 Q. Turning the page to page 11, you
11 state in the first paragraph under the heading Wildlife
12 as a Product of Forest Management that:

13 "Forest management is the process of
14 manipulating the forest environment to
15 produce a mix of products desired by the
16 owners. These products change with time,
17 economic conditions, public demand,
18 legislation and capability of the land."

19 There has been some concern expressed
20 earlier during this hearing with the previous Coalition
21 panels about the potential for the public to greatly
22 alter or change their expectations from the forest land
23 base over time and the potential ramifications this
24 would have in terms of altered expectations on the
25 forest industry.

1 Can I have your opinion as to the
2 potential for such concerns?

3 A. Yes. I have been at this occupation
4 for some 35 years and certainly expectations have
5 changed a number of times over that 35 years.

6 I have also worked in a number of places
7 in the United States, different economic regions,
8 geographical regions, and those public expectations are
9 quite different between regions; different in time and
10 different between regions depending certainly on how
11 dependent local communities are on timber products.

12 The system described does not cause those
13 shifts. It allows us the ability to respond to them in
14 planning and analysis because as the shift comes --
15 which can come rather suddenly in a change in law. For
16 example, with the institution of the National Forest
17 Management Act, suddenly that was not evolutionary
18 process. It had suddenly come to a point where we had
19 to react and react rapidly.

20 Such systems as the ability to forecast
21 habitat condition and impacts on forestry and forest
22 condition certainly comes to bear at that point, but it
23 allows you to adjust to those changing conditions in
24 terms of your analysis and forecast.

25 Q. Can I ask you, Dr. Thomas, what your

1 experience is in the United States in respect of these
2 changes in public's expectations on the forest land
3 space?

4 Do you have any specific examples and in
5 particular what I would ask you to address is concern
6 that has been raised previously that these changes in
7 the public's expectations might result in chaos or some
8 sort of disorganization that should not be tolerated?

9 A. Essentially the preparation of this
10 book was a response to chaos. The new National Forest
11 Management Act had made it very clearly that wildlife
12 was to be a joint product of forest management and we
13 needed to respond to that.

14 We did not have the capability at that
15 moment to respond and we were running into continuous
16 problems of appeals and court cases which we were
17 losing and this was an attempt to bring some order out
18 of that chaos, which it did.

19 Q. Now, on page 13 of this paper under
20 the heading The Blue Mountains Guidelines, in the third
21 paragraph you describe the development of guidelines
22 and their application in timber management planning.

23 Can I ask you to elaborate as to what
24 these guidelines comprise?

25 A. The guidelines in that particular --

1 that was what led to this document. Essentially we had
2 a large scale outbreak of Douglas fir tussock moth that
3 was the last large scale application of DDT in North
4 America in forest environments which merely indicates
5 to you the extent of the outbreak and the amount of
6 focus of attention that was on us at that point.

7 Much of the mortality in that outbreak
8 was in fir, particularly white fir that does not last
9 very long in a salvageable condition. We had to move
10 forward very quickly to begin the salvage of that
11 material.

12 The coalition of forest supervisors ended
13 up in my office and said: We really need some help in
14 being able to deal with the wildlife questions in this
15 concern. In this particular case it was a matter of
16 minimizing damage, and being a typical egghead I sat
17 there and thought about it and said: Well, our
18 information is not well organized, it's deficient. I
19 guess you guys can't go ahead and do this because we
20 just don't have the knowledge base to help you out.

21 The fellow looked at me and said: No,
22 you didn't understand. I didn't come to ask your
23 permission, I came to tell you what was going to happen
24 and if you have any knowledge that you can help us
25 bring to bear we would be happy to utilize it in our

1 operations, but otherwise get out of the way.

2 After it had been explained to me in a
3 manner that I could understand I -- and they said they
4 would certainly assign their biologist to assist me.
5 We found that within about a three-week period we were
6 able to synthesize a considerable amount of information
7 and bring it to bear in the form of guidelines that
8 would help.

9 After we had done that, and it
10 demonstrated to ourselves and our bossses that we could
11 do it, they came back and said: If you can do that in
12 such short notice you can probably figure out how to
13 synthesize information across 379 species in some form
14 that we can bring to bear in longer term planning and
15 that was the stimulus to make this first effort. By
16 the way, this has been upgraded several times since.

17 We were able to do that. Essentially we
18 put together the useful information in about a
19 six-month period primarily while we were also carrying
20 on our other duties which we let slide a bit while we
21 were doing this, but the point being is, it didn't take
22 10 or 15 years and 30 or 40 people.

23 Essentially using various talents
24 available to us from universities, our own internal
25 people, volunteers, college professors, we were able to

1 put together the basic information over the period of
2 about six months.

3 Q. By basic information, Dr. Thomas, can
4 you tell us what specifically you are referring to?

5 A. Essentially we divided this approach
6 into several factors. The first was the association of
7 the entire spectrum of vertebrate species with plant
8 communities and their structural or successional
9 stages. That was our first underlying base data that
10 we were going to bring forward into timber management
11 because very obviously we built it to be able to key
12 into information available from timber management
13 surveys and operations.

14 We then recognized that that was the
15 first overall cut, but that was not adequate to do the
16 total job because very obviously we had some species of
17 which we were considerably more interested than others.
18 So we used -- in this book we used elk and mule deer to
19 emphasize species -- or to demonstrate species which we
20 chose to emphasize in our wildlife management.

21 We then concluded that they were other
22 attributes of habitat that were not covered by the
23 general forest condition. We chose to illustrate -- in
24 this publication we used dead standing trees, snags, to
25 illustrate a specific kind of habitat element that was

1 useful or demanded by a large segment of the vertebrate
2 population.

3 We also used -- we call that a special
4 habitat and then we had special and unique habitats
5 that were geographic feature such as caves, talus,
6 cliffs that should be considered.

7 We then put forth a chapter to
8 demonstrate that we could quickly judge the impact on
9 wood production associated with any institution of
10 these particular guides and that essentially composed
11 the manual.

12 Since that time, of course, this has been
13 continuously updated with feedback. If I can ever slow
14 down a bit I would like to bring it up to speed.

15 There is one chapter in there that deals
16 with edges which is a special habitat component, but it
17 has a considerable consideration of diversity involved
18 in it. That chapter was cutting edge stuff in 1976.
19 It is sadly out of date now. I would continue to stand
20 with the rest of the book, but would caution about that
21 chapter on edges.

22 Q. The book was written and published
23 when, again?

24 A. It was published in 1979. It
25 actually became a useful set of information in 1976.

1 Q. The period over which all the
2 developments you have alluded to is?

3 A. The period of development of the base
4 information that we put to work in management was about
5 six months in its first form.

6 Q. Thank you. Now, still on page 13,
7 going across to the three boxes in the upper right-hand
8 side, I wonder if you could briefly explain the message
9 you are leaving readers of your paper by what is
10 referred to as Figure 2?

11 A. Yes. We were merely contrasting the
12 fact that direct applications of wildlife management on
13 a very site specific basis, contrasting that about what
14 we might attain from being fully coordinated with
15 timber management as a joint production, is the fact
16 that timber management is the primary activity that
17 alters habitat in the woods.

18 It affects many acres compared to direct
19 wildlife habitat management which is a very, very few
20 acres. Not that it shouldn't be done, sometimes it is
21 essential, but in comparison the impacts are much
22 greater in the form of timber management.

23 At the time this was written -- this is
24 somewhat altered at the moment now in the United
25 States, but our timber management programs were very

1 well financed while our wildlife management programs
2 were much, much smaller in scale in terms of financing,
3 That the timber management activity dramatically
4 affected the wildlife habitat.

5 When one goes into a cutting unit and 150
6 year old forests are reduced to zero age forest the
7 effect is dramatic. Good for some species, not so good
8 for others, but it is certainly dramatic. Usually in
9 terms of direct wildlife habitat management those
10 changes are not that dramatic.

11 Timber management has an immediate, an
12 immediate effect and sometimes quite large effect on
13 wildlife and basically if you consider it in the
14 overall vision direct wildlife habitat management has
15 got a miniscule effect compared to the effects of
16 timber operations.

17 When I say management, I mean that in the
18 sense of habitat manipulation; some change in habitat,
19 not hunting regulations.

20 Q. Thank you. Next turning to page 16
21 of your paper you will see in the upper left-hand
22 corner of that page there is Figure 4. Here I
23 understand you set out the relationships between the
24 two production goals of species richness and featured
25 species management and population and habitat

1 management.

2 Can you tell us what is the relationship
3 between species richness and featured species
4 management?

5 A. Yes. In one case, featured species
6 management would be to produce a desired species where
7 you want it and in the numbers that one desires to meet
8 a goal.

9 In the particular case in this book we
10 used deer and elk as an example of a featured species
11 and essentially indicated what the relationship was of
12 the welfare of those species in terms of their habitat
13 use related to certain forest conditions.

14 In species richness, this was an attempt
15 to satisfy the regulations under our National Forest
16 Management Act which requires us to maintain viable
17 populations of all species well distributed in the
18 planning area, and in essence if one is shooting for
19 species richness is it the maintenance of the highest
20 number of resident species in a viable sense.

21 That's related as well to diversity, but
22 it is not exactly the same thing.

23 Q. Can I ask you, when did the U.S.
24 Forest Service start employing featured species
25 management?

1 A. We have essentially been concerned
2 with featured species management, oh I suspect, running
3 as far as back as the 1930s as a general idea and a
4 concept.

5 In fact, until -- well after I had
6 graduated as an undergraduate in 1957 I think we
7 visualized wildlife management everywhere as the
8 production of game species. It was only since the
9 1950s that we began to be more and more concerned with
10 other species.

11 I think that is where the statement I
12 gave you earlier of good wildlife manager -- or good
13 forestry is good wildlife management. We were getting
14 surges in ungulate populations as we opened up forests
15 with cutting and that seemed to be what everybody was
16 interested in, including us. So that was the measure
17 of wildlife management.

18 It was suddenly brought to our attention
19 rather forcefully as the public attitude and the
20 science evolved that we should really have a broader
21 concern than a single species.

22 Q. The public attitude you are referring
23 to is what?

24 A. The public attitude -- I don't know
25 which comes first, the chicken or the egg, but

1 suddenly -- I think that's been true throughout any
2 managed forest operation anywhere in the world, that
3 our immediate first cuts were mechanistic; we do those
4 things this result comes out the other end.

5 Then we figured out that those activities
6 had something to do with the wildlife and the other
7 species that utilized the forest. I think that was our
8 first consideration and it is now very obvious that
9 everyone is moving to the idea that these are systems.

10 They are not trees and wildlife and
11 something else. They are a system that all works
12 together. That is an evolutionary process both in
13 science and in public understanding.

14 Q. Dr. Thomas, can I ask you whether
15 you -- well, can population and habitat management be
16 separated?

17 A. In one sense yes, but underlying a
18 population is a habitat. The population can not exist
19 without the habitat. The habitat can exist without a
20 population.

21 So the first base building block is the
22 assurance of habitat. Once that habitat will not then
23 automatically produce what you want, particularly if it
24 happens to be a big game species. In the other sense,
25 it is more likely that it will do what you expect in

1 the form of a game species and it also depends on
2 whether the species is there and whether it is under
3 management and protection.

4 But assuming that those things are true,
5 there is some differentiation in population management
6 versus habitat management. First, it must have the
7 habitat; secondly, the population must not be allowed
8 to damage its own habitat, but once those two things
9 are in place then there are all types of opportunity to
10 manipulate the population either in numbers or sex
11 composition. There is some potential to regulate
12 reproductive rates, age structure.

13 So in one sense once it's there it's
14 really a separate art in how that population is
15 manipulated to satisfy objectives.

16 Q. Thank you, Dr. Thomas. Now turning
17 to the next tab of the witness statement, Tab 9, and I
18 see you are a coauthor of a paper entitled Wildlife --
19 sorry, Tab 19, the paper entitled Wildlife from Managed
20 Forests - What to Think about While Chopping.

21 Turning to page 43, at the top of the
22 left-hand column you state that:

23 "There are several attributes of managed
24 stands that can be manipulated and
25 foremost among them are stand size,

1 Juxtaposition between stands, stand
2 configuration, species composition, stand
3 density, canopy closure, tree size,
4 growth rate, snags, timing of treatments,
5 spacial arrangement of stands and site
6 preparation. These are the same
7 attributes that the wildlife habitat
8 manager would consider in making habitat
9 manipulations."

10 Can I ask you, how do you envision the
11 decisions regarding these various attributes being made
12 in order to satisfy both timber and non-timber
13 objectives?

14 A. The mechanism, and I think the only
15 mechanism is the mechanism we have developed, is
16 essentially our requirement for our biologists to be
17 able to participate in the decision process by saying
18 these are the attributes that we want, these are how
19 these attributes should be manipulated in order to
20 yield the objective for wildlife on which we have
21 agreed.

22 First, it's necessary to define the
23 objectives, then it's necessary for the biologist to
24 define in a sense of a model whether that's a word or
25 mathematical model, how those attributes should be

1 manipulated. That's when they can go to work in a
2 joint production function analysis of forestry
3 output -- of wood output coupled with a meeting of
4 wildlife objectives, but if they can't be stated in a
5 form that they can go into the analysis and the
6 planning one is not nearly so apt to achieve the joint
7 production.

8 Q. Can I ask you, Dr. Thomas, at what
9 point in terms of time in the planning process do you
10 see these decision being made?

11 In other words, would you see these
12 decisions being made at the 20-year plan stage, the
13 five-year, the annual work schedule stage, the detailed
14 project planning stage or at what level? Do you have
15 an opinion in that respect?

16 A. All of the above, but essentially the
17 objectives are set forth in the highest level plan and
18 the decisions are made on ground application given the
19 circumstances of the particular area at the lowest
20 level.

21 So without going through the intermediate
22 stages, the objectives and overall commitment to joint
23 production is at the highest level. The details are
24 worked out by the ID teams at the application level.

25 Q. Can I ask you, based upon your

1 experience in the United States what is the
2 practicality of that particularly when you consider it
3 over the longer term?

4 A. It works very well. The point I
5 would like to emphasize is that this requires feedback
6 loops, adaptive management.

7 What one sets out on paper in a cold
8 blooded planning process once applied to the ground may
9 require adjustment. That's why the ID teams work at
10 the local level to be able to specifically apply
11 guides, objectives.

12 However, as we work at the local level we
13 sometimes find that things are unrealistic or that they
14 need to be modified to make them easier to apply. That
15 feeds back in the loop to the top of the planning
16 operation and one constantly readjusts in order to meet
17 realities.

18 Q. Dr. Thomas, can you tell me, what is
19 the importance of the role of the objectives in that
20 process?

21 A. If one does not have objectives -- in
22 many cases in the U.S. we had objectives to be careful
23 about wildlife, to be concerned about wildlife. When
24 the statement is so nebulously made it essentially
25 evolved to the point where our managers were striving

1 as they should to meet their given targets in timber
2 with some idea in the world that wildlife has some
3 function in life, usually handled through guidelines,
4 which were then interpreted as being constraints and
5 were very productive of conflict both internal to the
6 agency and with our publics.

7 When the statements are made as joint
8 functions they are to be produced at the same time and
9 essentially both become targets and there is an ability
10 to do that through forecasting and modelling, an
11 agreement of what will be produced, we became more
12 efficient and certainly less acrimonious in terms of
13 producing what evidently we had promised to produce
14 from our public lands.

15 MR. MARTEL: Dr. Thomas, however in the
16 States we still have the same problem we have here. I
17 mean, many of these -- we have heard from a colleague
18 of yours, Dr. Zane Gray--

19 MR. FREIDIN: Zane Gray Smith.

20 MR. MARTEL: --that many of these things
21 still end up in the courts.

22 DR. THOMAS: Oh yes.

23 MR. MARTEL: How many -- I guess it's the
24 best lay plans of men and mice, but how do we get
25 around or do we ever get around - and in Canada we

1 haven't tested the courts much on this process at all,
2 thank goodness maybe - how do we, despite all our best
3 efforts, get to the day when people realize you need
4 both?

5 If you live in northern Ontario you need
6 forestry for people to make a living and so on and for
7 a society at the same time you want to protect certain
8 values in the best way possible. There doesn't seem to
9 be an ability to come together because that's in fact
10 why all these things end up in the courts.

11 DR. THOMAS: Well, I entered on a
12 discussion of that yesterday in the sense of narrowing
13 the decision space. In a form that is agreement.

14 These things become -- at least they have
15 in the United States. After a while we have paid
16 gladiators on each extreme that fight it out, but they
17 do it indeed to find the extremes. Both of those
18 extremes recognize the points that you're making. It
19 is just that they are trying to move the decision. If
20 you have got this much space now, they want to move the
21 decision in their direction. That's rationale, but let
22 me describe the situation in the United States.

23 When we first started this -- we do too
24 much court action, absolutely, no doubt about that in
25 my opinion. However, when we began we lost nearly

1 every time we went to court. We now win considerably
2 more than we lose. In fact, we are moving toward the
3 point where we are winning most of the time. If you
4 win most of the time the number of court suits will
5 diminish. Essentially that's a measure of compliance
6 under our system of compliance with the law.

7 So I look upon this in our system as a
8 phase that we go through to come to an adjustment
9 between what the law says, what the executive branch
10 interprets it to say in action and what the courts say
11 is compliance. That's a sloppy system.

12 But the point that I was trying hard to
13 make yesterday and want to make today is a great amount
14 of our problem was an inability and an unwillingness to
15 address the problem head on and early. We merely --
16 all human being want to continue to do what they are
17 doing.

18 I like to have a certain thing for
19 breakfast and my wife says you can't have that anymore
20 because your heart is going to quit, you have got to
21 eat bran muffins. Well, if I had started eating bran
22 muffins when I was 20 I could probably have an egg now
23 and then.

24 The point being is, we have experience to
25 the south of you that would lead me to believe that you

1 can avoid much of that contention by moving forward now
2 and the point being, if we had the chance to regroup as
3 a professional forester and wildlife biologist,
4 ecologist, I wish that we had more ability to deal with
5 these situations merely with our professionals
6 satisfying public need.

7 It's unfortunate that we worked ourselves
8 into the box that we are in. I think you can avoid
9 most of that.

10 Mr. Martel --

11 MR. MARTEL: The reason I shake my head,
12 Dr. Thomas, as I indicated to you yesterday, twice we
13 sent the parties back to negotiate because if you get a
14 negotiated settlement the chances for peace out there
15 or resolution are much greater than an imposed
16 settlement. You don't have to be a rocket scientist to
17 understand that.

18 And despite our best efforts we really --
19 we made some progress the second time around and we
20 have a report, but there is far much more where there
21 is disagreement than where there is agreement.

22 Now, I don't know how close they came and
23 that's not for us to know, but obviously when you take
24 two runs at it stretching over two and a half years, I
25 guess, and you barely dent it, you know, you wonder and

1 you are not supposed to wonder out loud I guess, but
2 you do, at the inability to make the compromises to
3 reduce it to a small group of items that the Board
4 might have to decide and you have got this great number
5 of things that seem we should be able to reconcile much
6 of it and it doesn't work.

7 DR. THOMAS: In our case it didn't work
8 the first time either, but after we -- our board is the
9 Congress of the United States. After the Board got
10 tired and just made some decisions that we had to
11 respond to, the next time they asked us if we wanted to
12 think about this we thought a lot harder in the sense
13 that we wanted -- most professionals would rather
14 settle these things among ourselves given the
15 opportunity, but if we can't settle them, in our
16 country at least, big daddy is sitting up there and he
17 will and we didn't like it.

18 Next time we had it down to a lot smaller
19 series of professional issues by the time we went
20 through it again. It's an evolutionary process, at
21 least that's been our experience.

22 MR. O'LEARY: Q. Dr. Thomas, at the
23 bottom of page 43, in the left-hand column, you make
24 reference to the need for clearly stated objectives for
25 wildlife habitat expressed in terms of stand size,

1 juxtaposition and so on and that it is on this basis
2 that forest management team and responsible managers
3 can be held accountable for performance.

4 During the course of this hearing the
5 Coalition and others have been asked questions about
6 the reasonableness of using population objectives as
7 the basis to hold forest managers accountable.

8 In your view, can I ask you, what
9 measures should be used to determine the performance of
10 forest managers in terms of wildlife concerns?

11 DR. THOMAS: A. There is a great danger
12 in using population counts, particularly of ungulates,
13 as a measure of compliance with the objective because
14 that's only one attribute.

15 Essentially our experience in the United
16 States -- again, remember I told you that the states
17 are responsible for the populations and their
18 manipulation and on federal lands the federal officials
19 are responsible for the habitat.

20 Essentially we treat the same -- the
21 population is a product of habitat, but there are many
22 ways that the population can be manipulated. You can
23 cut hunter numbers to send populations higher, you can
24 control predators to send them higher and vice versa.

25 Essentially the only thing that our land

1 managers are responsible for is the production of the
2 habitat condition thought to underlie the desired
3 population level.

4 They must come together. The population
5 cannot exist without the habitat, but the habitat --
6 the population can only be considered in a separate
7 sense of how it is manipulated.

8 Again, as I told you yesterday,
9 particularly dealing with ungulates and I make no
10 illusion to Ontario, I'm not an expert here nor do I
11 know very much, for example, about moose, but
12 essentially in the U.S. if one merely monitors a
13 population of ungulates -- my experience in Texas, for
14 example, we thought we were doing a marvelous job
15 because our populations continued to rise each year
16 until the year came that the population within 30 days
17 became half of what it was. So I suppose under that
18 measurement we had failed.

19 What we had failed to do was to control
20 the population and we put too much faith that the
21 measure of our success was the population alone. At
22 that point we began to worry rather more considerably
23 about the habitat.

24 Q. Can I ask you, Dr. Thomas, what has
25 been the response of the teams and responsible managers

1 in the United States to this accountability that is now
2 imposed?

3 A. They did not like it initially. No
4 one likes more accountability that they already have,
5 but I think we have recognized that if we are going to
6 be held responsible for joint production, in this case
7 wildlife and forest products, that that is a welcome
8 way to do it.

9 It's not a matter much in the United
10 States of debate anywhere. We went through these
11 debates. We have passed them up now and are proceeding
12 on down the line of joint production.

13 Q. Just moving up to the top right-hand
14 column, Dr. Thomas, under the heading The Emerging
15 Forest Landscape, you state:

16 "What is just now emerging is the
17 recognition that that's strokes..."

18 Can I ask you, first of all, what do you
19 mean by the word strokes there?

20 A. This was entitled off an essay
21 written by Aldo Leopold and he said that foresters
22 write their signature upon the land and they do that
23 essentially by the manipulation of timber, which he
24 capsulized by chopping, and he said each manager writes
25 his signature on the face of the land and that's as it

1 should be, but here are some things you ought to think
2 about while chopping because it leaves a legacy. So
3 the stroke is the stroke of an axe.

4 Q. All right. You state that:

5 "What is just now emerging is the
6 recognition that strokes are
7 cumulatively producing the landscape that
8 will emerge as the managed forests.."

9 And you continue on to say:

10 "Repeated year after year and in place
11 after place these treatments will become
12 the dominant force that forges the
13 evolving forest landscape."

14 The Board has heard that natural forest
15 forces such as fire, disease, insects, windthrow are
16 major forces affecting the structure of the forest.

17 Is this not a contradiction with your
18 statements contained in this paper?

19 A. No. Certainly that statement is
20 true. We have fires, we have blowdown, we have natural
21 catastrophies, but year after year and we continue
22 century after century the predominant force on the
23 landscape, in a forest landscape, at least in the
24 United States, is man's actions.

25 In fact, you can begin with people who

1 are experts. We call them landscape ecologists. They
2 can definitely see the landscape patterns evolving.

3 In my part of the world they are evolving
4 and it is because of forest management, but the pattern
5 that's evolving is largely related to our deer, elk
6 management guidelines.

7 Q. Can I ask you whether or not you have
8 an opinion as to -- with the existence of these natural
9 forces, fire, disease, insect and windthrow, whether or
10 not you have a view as to the existence of cumulative
11 watershed impacts or just cumulative impacts aside from
12 those natural forces?

13 A. Yes. That's why you have to have
14 feedback. If, for example, I was dealing in a
15 watershed with a primary watershed concern, I had a
16 joint production model that considered water output,
17 wildlife and timber, as we moved along in that process
18 and suddenly a third of the watershed was subject to a
19 fire or a blowdown we would immediately have to
20 readjust our analysis of how we would continue to that
21 situation.

22 So they work jointly. One can never
23 predict exactly. What one has is a process of
24 prediction which is adjusted accordingly when the
25 unexpected happens.

1 Q. All right. Understandably a person
2 can see the results of fire, devastation from disease
3 and windthrow, do you have an opinion as to the ability
4 one can see the effects of the cumulative effects of
5 timber management activities and how long it takes
6 before one could noticeably see it by simply looking at
7 the forest landscape?

8 A. Yes, the best way to describe that is
9 by gimmick, I guess we call it, used to demonstrate to
10 the Congress these things where we used high altitude
11 satellite photography with the lower altitude
12 photography right down to the site to be able to look
13 at very broad expansion of land and see very broad
14 patterns and to bring that down to the site.

15 Now, the institution of saying units of
16 250 hectares per unit, you see that very clearly at
17 high resolution. By the time you've pulled it up you
18 don't see it.

19 However, if you look at this through time
20 at 10-year intervals suddenly from the satellite you
21 can begin to see emerging patterns. So it is a
22 function of scale. You very obviously see it quickly.
23 At small scale you see it more slowly than very large
24 scale.

25 Q. Is that something that you can go in

1 a helicopter or plane and immediately identify?

2 A. Not the largest scale. In fact, I
3 never saw it myself until we were either using pasted
4 together aerial photography or we were looking at
5 satellite photography.

6 Q. In terms of the cumulative impact,
7 let me use an example, of site degradation, soil
8 impact, is that something that you could, first of all,
9 immediately identify on an excursion through the woods?

10 A. About the only thing that you can see
11 in an excursion through the woods, you can see, let's
12 say in a very large clearcut, one can see in a
13 relatively short term, say 20, 30 years into the
14 situation, one can pick out places of high soil
15 compaction either by stunted growth or jay rooted trees
16 or trees that we were not able to regenerate.

17 Ordinarily we don't monitor that way. We
18 monitor the soil itself because these effects are
19 cumulative and they must reach some point before they
20 begin to show up in the forest itself or are recognized
21 that way, but merely look from a helicopter or walking
22 the woods, unless somebody is showing you what you are
23 seeing, most people would not see it.

24 Q. Thank you.

25 A. At least in the short term. If it

1 goes to the point of cumulative effects where one is
2 seeing a dramatic effect in the forest itself and it's
3 obvious, you are in trouble and the feedback loops are
4 going to be very long in terms of their positive
5 effect.

6 Q. Thank you, Dr. Thomas. Turning the
7 page to page 44, the third full paragraph, the
8 right-hand column, you describe the evaluation of elk
9 habitat models and you state that:

10 "Other models describing elk habitat
11 appeared after 1976 each with
12 modifications to suit local conditions
13 and biologists with different experiences
14 and views. "

15 This discussion suggests that there is no
16 consensus on elk habitat requirements and that there is
17 still considerable dissent and controversy regarding
18 elk habitat requirements; is that a fair assumption
19 that can be drawn from that statement?

20 A. Let me phrase my answer in stages. I
21 don't think there is much underlying argument about the
22 essential operative factors which are cover and forage,
23 edges, juxtaposition and control of roads.

24 I think where the debate comes is that --
25 not a debate. Since the initial model was put forward

1 in 1979 in that book we are using a model three
2 generations removed from that. Very similar to models
3 being used in British Columbia, but the basic
4 underlying drivers in those models are same; distance
5 from an edge, cover, forage and the impact of roads.

6 Where the debate comes is that some
7 biologists want to expand that. They say: I know
8 there is a food variable, there are several others,
9 then the impression of what Dr. Page put forward as
10 Occam's Razor, there is an argument about how many of
11 those variables should be brought to bear in the
12 analysis, but the basic two underlying variables, there
13 are two very little argument about those.

14 MADAM CHAIR: Excuse me, Dr. Thomas.
15 Could you repeat what are those two basic underlying
16 variables?

17 DR. THOMAS: Essentially in its briefest
18 form at the most gross level it is the ratio of cover
19 to openings; in other words, openings being those
20 created by timber management.

21 MADAM CHAIR: Yes. Could you comment on
22 evidence that we have before us that, in fact, the U.S.
23 Forest Service is changing its clearcut practices with
24 respect to regulation of clearcut size?

25 DR. THOMAS: We are in an evolutionary

1 process that is pretty messy at the moment.
2 Essentially in many of our forests we use clearcutting
3 as the best regeneration technique. It's certainly
4 economically the most feasible. Our regulations under
5 the National Forest Management Act limit those
6 clearcuts size to 40 acres. This is why one needs
7 readjustment.

8 I had something to do with that myself
9 because they asked what me what the best clearcut size
10 is - I and a team - to produce deer and elk and we came
11 to about 40 acres.

12 As we move forward with doing this,
13 suddenly biodiversity has leaped up as an issue and
14 that cuts or stand sizes or patch sizes larger than 40
15 acres are more functional in that regard.

16 The other aspect of it, we are moving
17 into some considerations of what we call new forestry
18 or new perspectives in forestry. Don't ask me to
19 define what that is precisely because I think what it
20 really means is we are willing as an agency to take a
21 new look at our practices given broader objectives and
22 to not necessarily consider our present practices as
23 ordained by God and that we should reconsider and use
24 other approaches if that's practical.

25 But if anyone is telling you that new

1 forestry or new perspectives is a well-tested
2 management regime, it is not. We are moving toward to
3 the testing of that now. It's merely a way to -- it is
4 merely a willingness to reconsider.

5 MR. MARTEL: Have you got a figure,
6 though, beyond what you as a biologist would not want
7 to see?

8 I mean, we have experienced in Ontario,
9 although it has changed dramatically, cuts that were
10 humongous, if I can use the word.

11 DR. THOMAS: I can relate to humongous.

12 MR. MARTEL: You find there can be a
13 rationale presented for all of that, but is there a
14 point at which when society says: Look, we have had
15 enough?

16 I mean, part of the feedback that you are
17 getting or have received is that the population was
18 really fed up with what was going on and didn't have
19 much say and they don't understand the process and when
20 they look -- I come from northern Ontario and I know
21 what they tell me. I mean, they tell me that a jack
22 rabbit needs to have a lunch pail to get across some of
23 the clearcuts. They really find it offensive, you know

24 So is there a size at which it becomes
25 just too large forgetting all the other factors?

1 DR. THOMAS: I'm not sure that there is a
2 magic point where it is okay if it is this many acres
3 and not okay if it is that, but certainly we ran head
4 on into the circumstance in the United States and we
5 were talking about much lesser sized clearcuts.

6 The point being is that I'm not so sure
7 that in some cases these questions are biological at
8 all. The person just looks at it and says this is not
9 acceptable. We consider that a valid thing to be
10 concerned about even though we go through an economic
11 rationale of why we did it, we may go through a
12 biological rationale of why it's okay, we go through a
13 hydrological assessment and we say no problem and the
14 guy says: I don't care, that is still ugly or however
15 one expresses their concern.

16 That's why we hired landscape architects
17 and we work in research with what is acceptable in the
18 aesthetic sense; how happen rapidly we can move it to a
19 more aesthetic sense.

20 The other one sometimes is not a matter
21 of the fact that it is a clearcut that's 40 acres, but
22 it's a square sitting up there on the side of the hill
23 above Seattle and people look at that and they say: I
24 don't like that, that's ugly and now there are 12 of
25 those little squares.

1 Our landscape architects have been
2 able -- not to allay the problem totally, but to make
3 it more acceptable. You don't have to make them
4 square. They can look like meadows on the side of the
5 hill or something from Seattle.

6 So there are visuals that we build in.
7 We have a number of models that one can bring up on a
8 computer and play games with different view sheds of
9 how this would look and with test panels and saying:
10 How do you like this versus that, and it does look
11 better aesthetically to me, but secondly, that may not
12 be the point of how it looks to me, but how the public
13 perceives it and whether they perceive that you are
14 making some attempt to consider that in the layout and
15 management.

16 Now, we have a tendency to be very
17 careful close to population centres and less careful in
18 our analogy of places to northern Ontario. We have
19 suddenly found out with an increasing population in the
20 fact that airplanes fly everywhere that we need to be
21 careful everywhere and we are being more careful.

22 But in the biological sense, I think if
23 you give me an objective I can talk to you about
24 appropriate sizes of clearcuts to meets those
25 objectives. If you are talking about how big is too

1 big to make the public happy, I don't know. That's
2 going to be a visual thing.

3 We are very careful, we are very
4 concerned about that and we are spending more time
5 being concerned about it. When somebody jerks your
6 rope real hard you have a tendency after about the
7 third jerk to pay attention. We're paying more
8 attention.

9 See, what the trouble was is we didn't
10 really consider that part of forestry. If it was the
11 rationale economic forestry thing to do with
12 appropriate regeneration and even with the
13 consideration of joint production functions, we said
14 that's good and as professionals we could agree to
15 that. The public said not good enough yet because we
16 are concern about this other factor and we have learned
17 if they are concerned we are concerned.

18 MR. O'LEARY: Q. Dr. Thomas, can I ask
19 you whether or not you have an opinion as to the
20 desirability of setting a fixed maximum clearcut size
21 generally?

22 DR. THOMAS: A. I'm not particularly
23 concerned with that because I think that if you have
24 good joint production objectives and good spelled out
25 approaches to meetings those objectives in the analysis

1 and forecasting that would not be a problem.

2 I suspect humongous clearcuts -- I don't
3 really want to comment about it, but our humongous
4 clearcuts, if we had used such a process we would have
5 never made the cuts. They were made for a particular
6 purpose which was economic forestry without
7 consideration of joint production or of aesthetic
8 value. There is nothing magic about 45 acres versus 40
9 versus 100.

10 Q. Can I ask you, Dr. Thomas, did you
11 have an opportunity to review the Coalition's Panel 6
12 witness statement?

13 A. Yes.

14 Q. And do you have an opinion as to
15 whether or not you agree or disagree with the general
16 comments and statements contained in that witness
17 statement?

18 A. I would agree in general. I might
19 want to debate some minor points, but in general I
20 would agree.

21 Q. All right. NOW, under Tab 20 of the
22 witness statement to this panel there is a paper.
23 Again, you have been involved in the preparation of
24 this and it is entitled Management and Conservation of
25 Old Growth Forests in the United States.

1 Can I ask you whether or not this paper
2 has any relationship to the management for biodiversity
3 objectives?

4 A. It does in the sense that in managed
5 forest conditions there will certainly not be an
6 absence of younger growth -- of younger forest. That
7 will occur primarily as an outgrowth of timber
8 management.

9 We would certainly not anticipate any
10 shortage of stands in any particular stage of
11 development up to that described by economic maturity;
12 this is when the stand is at its economic zenith for
13 cutting.

14 If one is concerned about biodiversity in
15 forests, through that logic you immediately begin to
16 focus as the key element on the stands that are beyond
17 economic maturity. So that is what it has got to do
18 with it.

19 Q. If I could turn you first to page
20 256, the right-hand column under the heading Old Growth
21 Management, the third sentence down, you state:

22 "The ecological complexity of old
23 growth makes it unlikely that forest
24 managers can create functional old growth
25 through silvicultural manipulations at

1 younger aged second growth forests.
2 Certainly, such knowledge does not now
3 exist. Therefore, management plans for
4 providing old growth as part of
5 managed forests must be based at
6 least initially on existing old growth
7 stands."

8 Can I ask you, Dr. Thomas, whether you
9 have an opinion as to whether the Coalition's terms and
10 conditions Nos. 158 through to 162 are consistent with
11 this view?

12 A. I think so, yes.

13 Q. Later on in the same page, you state:
14 "Old growth stands reserved from cutting
15 will not last forever. Destructive
16 events (i.e., fire, windthrow, insect
17 and disease outbreak) that are improbable
18 in the short-term are inevitable over the
19 the long-term."

20 Can I ask you whether or not there is any
21 relationship between this comment and the proposal put
22 forth by the Coalition to allow the 10 per cent
23 requirement to migrate over the landscape over time?

24 A. I think that's full recognition of
25 that problem. The other, in looking at this article I

1 would also caution that it was primarily aimed at the
2 old growth forest of the Pacific northwest which can
3 exist as a forest structure over centuries as opposed
4 to forests that may be more subject to catastrophic
5 regime or may deteriorate in ecological succession at a
6 much younger age, but the principle applied there is
7 good.

8 The standpoint, as I read about Ontario
9 and talk to my colleagues, that the normal ecological
10 succession that old growth forests do not sustain
11 themselves over centuries but come and go along a
12 continuum.

13 Q. Thank you. Now, there were a number
14 of questions during the evidence of the Coalition's
15 Panel No. 6 regarding the impact of taking 10 per cent
16 of the land base and retaining it in the oldest seral
17 state.

18 Based on your understanding of the
19 Coalition's terms and conditions, what impact would you
20 expect this would have on wood supply?

21 A. We have some similar allocations in
22 the U.S. and on the surface it appears if you remove 10
23 per cent of the land base you cut the timber, potential
24 timber yield, MAD you call it, by 10 per cent.

25 Not necessarily so in the sense that if

1 one is innovative about where those reserves are
2 placed, if an area is reserved for some other purpose
3 already and can serve two purposes the impact is zero.

4 Even if you reserve an area for a period
5 of time and then replace it the cost of the timber
6 yield is not 10 per cent, even in a worst case. It's
7 probably considerably less than that. I would off the
8 top of my head estimate 5 per cent or less because the
9 timber does become available sooner or later. The
10 trees do continue to grow, even though your past
11 culmination of mean annual increment they may be losing
12 value. You don't lose it all. It's ultimately taken
13 and another stand replaced.

14 So essentially the loss is -- financially
15 is the time and cost of money and, secondly, whatever
16 growth is lost in the process, but it's not a direct
17 one-to-one ratio. It would certainly be less than 10
18 per cent.

19 Q. Do you have any examples of that in
20 the United States, Dr. Thomas?

21 A. Only on paper. We haven't gone far
22 enough with this to be harvesting those units yet, but
23 if you model it out on the back of an envelope you
24 would come to that conclusion rather quickly.

25 There will be an effect. Again, if it's

1 in a reserved area reserved for something else and one
2 can sustain that, the cost for the additional benefit
3 is zero. Of course, there was a cost in the initial
4 reserve, but you have already marked that off to
5 something else. Again, like I told you it was a
6 tow-fer; two for one. You get double benefit with
7 intelligent allocation, but even where it is right
8 smack in the middle of the timber base the effect won't
9 be 10 per cent.

10 Q. Dr. Thomas, why is it necessary to
11 specifically manage for biodiversity in old growth in
12 timber management plans?

13 A. In essence, if one does not manage
14 for it particularly in a disturbance regime, which I
15 understand is typical of Ontario, that if you don't
16 manage it for it intentionally, assuming that you went
17 to the wall on maximum MAD, allowable cut as we would
18 call it, in essence that old growth would disappear out
19 of the system.

20 Those stands that are beyond economic
21 maturity would not be considered rationale in a
22 straight, across the board allocation or study of
23 timber and financial return. So there is not an
24 incentive. There is no economic incentive to do it.
25 The incentive has to be otherwise if you are going to

1 be concerned about it which is the retention of
2 biodiversity.

3 Q. Perhaps I could focus the attention
4 on Dr. Page for the next question and that is in
5 respect of the Coalition's proposal about the 10 per
6 cent of the oldest seral state.

7 Can I ask you, how does this objective in
8 Ontario compare to those in B.C. for biodiversity and
9 old growth?

10 DR. PAGE: A. Very similar. We are
11 looking at essentially the same relative proportion of
12 the land area. The difference on the coastal forest
13 where most of the old growth attention exists now, the
14 attention that appears in the Globe & Mail in Toronto,
15 is clearly a different forest than anything comparable
16 in Ontario and those forests are centuries old and so
17 reservation now can be expected to continue for
18 centuries.

19 But throughout the rest of the province,
20 we are also as concerned -- or there are no ecological
21 areas in the province that we are not concerned about
22 also about old growth retention including the boreal
23 zones.

24 There is a strategy and task force
25 underway now. The report has been released to the

1 public. An old growth strategy is being developed to
2 try and managed for old growth throughout the entire
3 province in all the ecological areas.

4 Q. Mr. Patch, is there anything
5 comparable in New Brunswick?

6 MR. PATCH: A. Yes. Earlier when I was
7 talking about the new Brunswick process I stated that
8 on each Crown timber licence we have set an objective
9 for amount of hectares to be in mature and overmature
10 coniferous forest habitat.

11 What we're saying is that we want so many
12 hectares over time to be in a certain condition not
13 only in terms of the amount of the hectares, but also
14 to have them spacially meet requirements as defined by
15 the habitat requirements for marten.

16 What is clear is that the area to be
17 managed to meet the production objective of so much
18 area and mature coniferous forest habitat can't always
19 be in the same place throughout our planning horizon
20 and that we recognize the events, such as the natural
21 change in stands, because it is those areas today that
22 are providing mature and overmature coniferous habitat
23 cannot be the same areas that will provide that at some
24 point in the future. It might be 10 or 60 years down
25 the road depending on the individual stands.

1 So in our habitat supply analysis
2 approach we are looking at the projection of the forest
3 condition among all stands and the proportion of area
4 that is in mature coniferous habitat and how much will
5 be available through time.

6 In the first stages of our plan we
7 specifically spacially reference it on the maps that I
8 was showing early in my evidence, but we recognize that
9 those areas that are outlined today do not represent
10 the area that will be providing that type of habitat
11 through the future.

12 The proportion of area that is in mature
13 coniferous forest habitat represents 10 per cent of the
14 area of softwood forest on each Crown timber licence.
15 We have related that amount of area to an expected
16 result in numbers of marten populations based on our
17 understanding of how much habitat they require.

18 MADAM CHAIR: You will have to digitize
19 that information, Mr. Hanna.

20 (laughter)

21 MR. O'LEARY: Q. Dr. Thomas, I would
22 like to show you an exhibit that was filed by the
23 Ministry of Natural Resources and it is a graph and it
24 obstensibly sets out in their view a continuum of
25 wildlife management going from the simplest, being to

1 manage for biodiversity, to the most complicated, being
2 multi-species management.

3 This is Exhibit 472, Madam Chair, and you
4 recall we referred to this a few weeks ago.

5 Have you had an opportunity to see that,
6 Dr. Thomas.

7 DR. THOMAS: A. I have.

8 Q. Do you agree that this is an accurate
9 reflection of the continuum of wildlife management
10 techniques available to manage forest ecosystems?

11 A. In my view it's not a continuum. It
12 is a separate series of objectives that I would not
13 consider to be a continuum.

14 Q. In the evidence of the Ministry of
15 Natural Resources and also part of Exhibit 472 they
16 state that they should be judged by their achievement
17 of their natural objective for moose populations and
18 viable populations.

19 Do you have any comment in that regard?

20 A. I certainly think that's correct
21 provided the objectives are clearly stated as to what
22 they mean in terms of habitat. Then I think that's
23 certainly a true statement.

24 Q. All right.

25 A. I would go a little further. I don't

1 want to belabour it, but there is a danger in merely
2 judging success bt populations, particularly with
3 ungulates.

4 Q. Can I ask you, Dr. Thomas, do
5 wildlife population objectives have any role to play in
6 timber management planning?

7 A. In the sense that you use timber
8 management planning, yes. They certainly have a role
9 in forestry. If the owners of that forest, and in our
10 case in the United States that's the public, set
11 wildlife out as an objective of forestry, then that is
12 certainly true.

13 Q. The next series of questions are a
14 result of the scoping session that we held a couple of
15 weeks ago and these are questions that -- at least the
16 ones we hope are remaining. We have tried to reduce
17 it.

18 We think some of them have been answered
19 already, Madam Chair.

20 These are questions that have been put to
21 us by the Board and perhaps I would ask each you to
22 respond where appropriate.

23 The first, I will just read you the
24 passage.

25 "We are putting this before you because

1 it seems to be the position of certainly
2 Dr. Page and Mr. Patch that you can't
3 implement habitat supply analysis unless
4 you have digitized forest information of
5 some description available for the GIS
6 analysis. It seems in British Columbia
7 and New Brunswick it either has such
8 information digitized from the timber
9 supply side or they spent their first
10 stage of the HSA program doing that."

11 Could I ask both of you to comment on
12 that understanding of your evidence?

13 MR. PATCH: A. I think in the earlier
14 testimony I was describing how, and it's in my witness
15 statement that if I was to manage and have great
16 confidence in my predictions and understanding of where
17 and when I was going to apply management and what the
18 impacts would be on the landscape I could be much more
19 efficient if I had a geographic information system. If
20 I had the technology to be more efficient.

21 But as we have said earlier, I think all
22 three members of the panel, it is not absolutely
23 essential to have digitized information, to at least do
24 some rudimentary analyses of what the future forest
25 will look like and the availability of different stand

1 types through time.

2 Q. Thank you. Dr. Page.

3 DR. PAGE: A. I would concur. As I
4 mentioned before, the very first HSA that we conducted
5 that is referenced in the 1987 transactions of the
6 North American wildlife conference was performed
7 without the use of any digital information.

8 I said at that time we used the computer
9 solely for the aerial summaries which could have also
10 been done by some other manual method.

11 I would like to stress that HSA and HAP
12 we call specifically a tool. It's there to be used.
13 There are other ways of achieving the same thing. It
14 is just one of the tool that's available.

15 Beavers manage to cut down trees with
16 their teeth, I suppose foresters could, but it would be
17 foolish to suggest that you couldn't cut down trees --
18 or that you would cut trees without the use of the
19 appropriate tools.

20 Q. Thank you. Moving on, the next
21 question is to you, Dr. Thomas. The Board is
22 interested in your personal view as to how satisfied
23 you are with public involvement in the timber
24 management/wildlife forest management projects in which
25 you have been involved.

1 They would like to know how satisfied you
2 are with the public involvement, how confident you are
3 that the public makes informed choices and whether you
4 believe -- and how you understand the public makes
5 these choices.

6 The Board would like to know how does one
7 sit down and translate what the public wants into what
8 one does on the ground.

9 DR. THOMAS: A. It's tough. The public
10 doesn't make decisions in our system. We operate under
11 the law. It's our charge to make those decisions
12 within the law.

13 The law also requires that we have public
14 input and that's exactly what we consider it to be. We
15 have found it extremely challenging to be able to
16 consider that output rationally.

17 I think what we visualized at the
18 beginning that rationale people would come and reason
19 together and come to compromised or at least consensus
20 opinion has not materialized, particularly as public
21 opinion and pressure groups have formalized themselves
22 into what I call paid gladiators.

23 However, for example, in a hot issue one
24 may get 5,000 form letters signed by one group or
25 another and it's very difficult to evaluate. That's

1 not informed, that's not expression. It is just: I
2 don't want you to cut anymore trees or I want to get
3 all the trees. So they are considered, but they are
4 put down.

5 However, what we have achieved out of it
6 is when sincere people come to the table with good
7 questions and good ideas that we are able to modify to
8 adjust to those ideas and concerns.

9 In the end does it end up in consensus or
10 with everyone being satisfied? Unfortunately, I think
11 it ends up with nobody being satisfied. That's a
12 fairly sad description of success, is I must have done
13 good because everybody is yelling at me.

14 I rejected that until I had to step into
15 the arena and be responsible instead of -- you know,
16 researchers get to pontificate about everything and be
17 responsible for absolutely nothing.

18 In the last several of years I have been
19 charged with the responsibility and it is a sobering
20 experience, but I think the good part of it is that
21 they do have a place to say what they want to say. We
22 do have an ability to respond to good ideas, to good
23 suggestions or to be very aware of concerns. It did
24 not bring us any closer to a happy, happy world.
25 That's the way we handled it with public input at a

1 number of sessions at the highest planning level and at
2 the lowest operation.

3 I have seen plans considerably modified,
4 however, particularly at local level due to expressed
5 concern. For example, we have loggers come in and say:
6 Hey, guys, you know, I don't think you guys ever did
7 any logging, this is stupid. This is going to cost us
8 "x" amount of bucks and here is a better way to do
9 this. Tell me what you want to do, here is a better
10 way to do it.

11 The environmentalists may come on the
12 other side and say: Hey, you forgot so and so or you
13 didn't consider such and such and we would readjust to
14 that, but in the end I don't know that we are any
15 closer to being happy, but I think we are a lot closer
16 on the decision space that at least the public has some
17 way to go and express their concerns and their desires.
18 It is not a panacea.

19 Q. The next question, Dr. Thomas, arises
20 out of page 19, question 30 in your witness statement
21 where you stated:

22 "In my view a major gap of timber
23 management today is failure to provide
24 adequate resources to effectively and
25 comprehensively monitor local effects."

1 The Board would like your opinion as to
2 what you would consider to be adequate resources with
3 respect to the monitoring of local effects that you are
4 familiar with or with which you have had experience?

5 A. We are required by law to do
6 monitoring. It's divided. Compliance monitoring means
7 you go out and check to see if you did what you were
8 supposed to do. That's fairly straightforward, fairly
9 measurement.

10 The local effects monitoring in terms of
11 pounds of forage production, in terms of a certain soil
12 condition remaining after harvest and hydrological
13 conditions, we are still fighting that out in how we
14 are going to monitor it and we have promised a lot in
15 monitoring.

16 Now when it comes time to do it we are
17 going to have to figure out how we can do it within the
18 level of resources that are available to us. It is one
19 thing to go in and say I need a thousand units of
20 resources to monitor this appropriately and your
21 congressman or the U.S. Congress falls over backwards
22 laughing and says: No, you get a hundred, and then we
23 go back and figure out how do the best we can with what
24 we have got which is a hundred, but that is being
25 worked out now.

1 The local effects monitoring will be
2 different from planning area to planning area because
3 the objectives will be different, but those details are
4 just now being worked out. The only thing I can tell
5 you for sure it is required by law and we are going to
6 do it at some level.

7 MR. MARTEL: At some time.

8 DR. THOMAS: Well, we are going to do at
9 some level pretty quick or under our system we are
10 going to get shut down. We are going to come into
11 compliance with the law one way or another. We are
12 doing the best we can with what we've got.

13 MR. O'LEARY: Q. The Board then referred
14 us to page 22 of the witness statement where you state
15 that:

16 "In your understanding Ontario does not
17 have the same level of supervision in the
18 bush that the U.S. Forest Service has."

19 The Board would like to know from you
20 what size forest area is considered manageable for U.S.
21 foresters and technicians to supervise on a continual
22 basis?

23 A. I have to answer the question in a
24 convoluted way because it is not a matter -- it is not
25 a function of how big the area is. It is a function of

1 how many people you have available to do it.

2 The only thing I -- I think the best way
3 to answer that question is, any ongoing operation such
4 as road layout, construction, timber harvesting,
5 replanning, fertilization, whatever our mechanisms are
6 that are performed by private entities are under
7 continuing supervision by one of our people.
8 Compliance monitoring really. So we have enough people
9 to do that. If we don't have enough people to do that
10 we don't do it.

11 MR. MARTEL: What do you mean by that,
12 Dr. Thomas, though, they go out once a week, they go
13 out once a month, they are there daily?

14 DR. THOMAS: Say with the construction of
15 a road, a road engineer will probably check on road
16 construction operations on a weekly basis.

17 Planning, somebody supervising planning
18 will go out initially with the planning crew so that
19 there is an understanding of what is going on. They
20 may not be back until the planning job is complete or
21 may show up once a week.

22 Timber sale operation is probably -- if
23 it's in a delicate situation we will have somebody on
24 site all the time. Ordinarily, probably the site is
25 visited on a weekly basis.

1 A lot of that has to do with sensitivity.
2 If we are on easy operating ground where it's flat,
3 there is no anticipated environmental problems, we are
4 dealing with an operator that has a long history of
5 performance, he probably gets checked at a much lesser
6 rate than, say, an operator that we have less knowledge
7 of or, secondly, that we are operating on steep ground
8 or we are on fragile soil.

9 So it depends on the sensitivity. Some
10 jobs are not very sensitive, others are very sensitive.
11 Like everybody, we don't have enough people to go
12 around. So you have to use our head to do it. You do
13 what you have to do at the level you have to do it, but
14 you use your head too. There is no sense visiting easy
15 ground every day with an operator you have been working
16 with for 25 years who always gets an A plus. He
17 doesn't get checked very frequently.

18 MADAM CHAIR: Shall we take our break
19 now, Mr. O'Leary?

20 MR. O'LEARY: I won't be much longer
21 after the break.

22 MADAM CHAIR: All right.
23 Mr. Lindgren, you will be
24 cross-examining?

25 MR. LINDGREN: Yes, I will, Madam Chair.

1 MADAM CHAIR: It sounds like you will be
2 ready to get started soon after the break.

3 MR. LINDGREN: Thank you.

4 ---Recess at 10:30 a.m.

5 ---On resuming at 11:55 a.m.

6 MADAM CHAIR: Please be seated.

7 MR. O'LEARY: Q. If I could turn to you,
8 Dr. Page. The Board referred us to a statement made by
9 you at page 50 of the witness statement and it was to
10 this effect:

11 "As responsible managers working on
12 behalf of the public you have a
13 duty to ensure that the desires of the
14 public are understood and incorporated
15 into timber management plans."

16 In British Columbia, the Board would like
17 to know how you obtain the public's view of what the
18 public wants to see in timber management plans and the
19 Board has asked that question and put that one to you,
20 Dr. Page.

21 DR. PAGE: A. Well, judging from the
22 media reports in particular the public is unsatisfied
23 with their participation in the planning process in
24 British Columbia.

25 The new government in British Columbia

1 has announced a land use commission on the environment
2 and resources that's going to attempt to provide more
3 of a forum for public input. We have had other public
4 commissions, but in the normal forest management
5 planning process there is no direct method for public
6 input.

7 Generally, there is also no requirement
8 for public review, though controversial plans are
9 almost exhibited for public review.

10 I don't think it is appropriate for the
11 public to have to express their interest in the
12 forested land base on the end of the logging road
13 before the media and we are in the process of changing
14 our forest planning methodology in our province in
15 recognition of many of those concerns.

16 Our current assistant chief forester in
17 1989 said that our timber management planning process
18 at a timber supply area level was at that time 10 years
19 out of date and it still has not substantially changed.
20 We are in the process of attempting to determine the
21 direction that that change should go in, but so far we
22 haven't finalized what the public input would be.

23 MR. MARTEL: We have declined taking the
24 job out there.

25 MR. HANNA: We have recommended you.

1 DR. PAGE: You may have noticed it is a
2 one-man commission. They couldn't get anyone else.

3 MR. O'LEARY: Q. I would like to put the
4 next question to the panel generally. It involves some
5 of the concerns or uncertainties that have been
6 expressed or asked by various parties in respect of the
7 amount of paperwork or volumes that would be required
8 or associated with the setting of objectives and the
9 use of HSA in Ontario.

10 What I would like to ask is what your
11 experience is in terms of, you know, the amount of
12 paperwork that is involved, the volumes of it, if it is
13 volumes, how manageable is it.

14 Can you give us an idea of what your
15 experience is? Perhaps we can turn first to you, Dr.
16 Thomas.

17 DR. THOMAS: A. I do not perform such
18 analyses on a day-to-day basis. My job was to help
19 develop it. Much of it was computerized. There is no
20 great volume of paper associated with it by necessity.
21 We have some people that can turn anything into great
22 volumes of paper.

23 So it varies a lot from individual to
24 individual of how much -- you know, using paper as an
25 allegory for unnecessary work. It varies, but there is

1 no necessity for it inherent in the process.

2 Q. Mr. Patch?

3 MR. PATCH: A. Well, I guess I turn to
4 the example of the progress report that was from the
5 New Brunswick program that was entered in evidence
6 yesterday and --

7 Q. Exhibit 2105. Sorry.

8 A. Okay. In that report it specifies
9 the habitat objectives on each Crown timber licence and
10 there is background information that describes how
11 those objectives were defined.

12 I guess the point is that in one
13 relatively small document we have managed to describe
14 the habitat objectives for all the Crown timber
15 licences in the province.

16 The work behind the -- the establishment
17 of those objectives is not something I would want to
18 minimize in terms of there was a lot of work and
19 understanding how much deer habitat was required to
20 support how many deer and so on.

21 The work in defining what is deer habitat
22 was extensive based on the best information we had
23 available from the literature and from New Brunswick
24 experiences, but the actual paperwork, if you will, in
25 defining the objectives and passing on that information

1 to the Crown timber licensees, the forest industry who
2 are developing the plans that was not extensive.

3 Q. Dr. Page, do you have a view as to
4 how manageable the paperwork, if any, that has been
5 generated as a result of your use of HSA in British
6 Columbia?

7 DR. PAGE: A. To concur with Dr. Thomas,
8 the computerization of most of the data and the
9 information, the scenarios and the planning results
10 should in theory result in considerably less paper,
11 though the ability to view those -- the results of
12 those activities on the computer may be limited by
13 individuals who are not comfortable with the computer
14 or don't have access to a computer database.

15 For those individuals, the computer, as
16 Dr. Thomas has alluded, can spit out reams of paper and
17 does. We haven't been able to use that technology to
18 reduce the paper load. For the planners themselves,
19 the paper is substantially reduced from basically a
20 single sheet of paper for every single stand
21 manipulation to the computerized summary of the overall
22 results.

23 MR. PATCH: A. I think I would like to
24 add to that. In terms of the tools that we are using
25 in habitat supply analysis and the information, it is

1 precisely the same tools and information that are in
2 place for the timber management process. So these
3 things are used concurrently.

4 So the incremental cost associated and
5 volumes of paper as a result of habitat supply analysis
6 is minimal because we're using the same information and
7 the same outputs that are beingd use for timber supply
8 analysis.

9 DR. PAGE: A. One really important
10 component of having the forest cover information in
11 particular, which is a relatively large data set on the
12 computer, is you can access a wide array of
13 information, generalized information across many map
14 sheets very easily.

15 For planning exercises that span a single
16 unit and particularly that span a single map sheet, it
17 is the only effective way of dealing with those kinds
18 of things. You can imagine the difficulties of placing
19 all the individual map sheets for an entire region or
20 district together on the wall or the floor and
21 attempting to make any generalization about it which is
22 the level of analyses that were necessary previously to
23 computerization of the information.

24 Q. Dr. Thomas, I wonder if I could put a
25 general question to you and it is in respect of

1 questions that have been put to prior Coalition panels
2 about, when do we know when we have committed
3 sufficient resources?

4 When do we know when we have conducted
5 enough research into matters? It is a problem -- a
6 concern that's been expressed as to how far do we go,
7 how much do we have to spend, when do we know when we
8 have reached that point when we can say, that's enough
9 and now we can proceed?

10 Do you ever a general view or response to
11 those concerns.

12 DR. THOMAS: A. Having been in this for
13 some 35 years, no, I think we probably have an
14 inexhaustible desire for information, more knowledge,
15 more people.

16 Ultimately we have to decide how we can
17 allocate the resources that are available to us. There
18 is a grave danger in a very seductive scenario that,
19 well, we will delay operations until we have absolute
20 knowledge.

21 There is no final truth. There is no
22 absolute knowledge. We always have to operate on the
23 basis of what we have at our disposal. Decisions
24 cannot be delayed on that basis unless we decide to
25 step back and cease and desist operations until we have

1 perfect knowledge. We are not going to live that long.

2 There is a danger in doing that, of
3 saying I will delay attention to a significant problem
4 because I am going to do research and in 10 years I
5 will have the information at my disposal to address the
6 problem better.

7 One, that's not necessarily so. In 10
8 years you may have more information, but you may have
9 discovered that you are more confused than ever. So
10 that's a danger.

11 The second one of it is, it assumes that
12 we know nothing and we usually know quite a bit. So we
13 have to move now and adjust later.

14 When do we do enough monitoring? I
15 suspect we are going to come to the conclusion that we
16 do enough of all of these things when we have devoted
17 the resources to it that we can afford.

18 I cannot visualize of a limit to
19 monitoring that could not always be improved. At some
20 point we have to use what we have, we have to pick the
21 best variables we can measure to get the biggest bang
22 for our dollar and we have to decide at what level we
23 need to measure that.

24 For example, if you want very high
25 accuracy, say you are willing to take a 1 out of 20

1 chance of being wrong and you want to be within 10 per
2 cent of being exactly right, it will cost twice as much
3 or four times as much of taking a 1 out of 10 chance of
4 being wrong and allowing a 20 per cent margin for
5 error. So those things all have to be calculated.

6 The first rule is, don't do more than you
7 have to, don't do more than you need to and if you are
8 short on money pick those areas for monitoring where
9 you get the biggest bang for the buck.

10 Q. Dr. Thomas, I would also like to put
11 a hypothetical to you and that is, what would happen in
12 the situation where you want to produce a certain
13 number of animals in a particular forest management
14 unit and these animals decide for some reason to move
15 into another forest management unit and then presumably
16 you haven't met your habitat supply objectives in that
17 timber management unit?

18 Can I ask you whether or not is that what
19 you are looking for. Is that relationship a conclusion
20 you can draw that they moved into another forest
21 management unit and that you haven't met your habitat
22 supply objectives?

23 A. The first thing you may have is an
24 inappropriate management unit, which is quite likely.
25 As I say, if your management units split a watershed or

1 split a boundary line that's artificial the unit may be
2 artificially defined.

3 But ultimately let's say we are dealing
4 with an animal like a pileated woodpecker. If you
5 displace them from their territory they must find
6 another territory that they can occupy. Territoriality
7 means that birds protect themselves against others of
8 their own kind.

9 If you have 10 territories next door and
10 they are occupied that woodpecker is not going to
11 occupy one of those territories unless he displaces the
12 birds that are already in the territory. So you have
13 just lost him.

14 Animals do shift. However, animals that
15 are territorial are limited. Let's say, you had an elk
16 population where you had a hundred elk in one
17 management unit and a hundred in the other and you
18 displace those animals and they moved, if you did that
19 they left for some reason. Either you guessed wrong at
20 what their habitat requirements were and they had to
21 leave in order to survive. If they move into the next
22 unit and there is surplus habitat, surplus food for
23 them they might sit there. If there is not, then you
24 are going to have a bad situation in the next unit
25 over.

1 So that is a very brief, but conceptually
2 shifting animals around implies some underlying
3 problems. If you meant to keep them there and you
4 didn't, you missed, you guessed wrong.

5 Q. Dr. Thomas, the next question I have
6 for you arises out of a comment by Mr. Martel during
7 Panel 2 of the Coalition and Mr. Martel stated that:

8 "I have concern. I am trying to figure
9 out what in timber management is really
10 effective for the full rotation.
11 Certainly it wouldn't be pine marten, for
12 example, they come back after
13 a successional period. As a successional
14 process starts moose will be there for a
15 while, if there is deer deer will be
16 there, things move on, and even tourism."
17 Can I ask your thoughts about what Mr.
18 Martel has said.

19 A. Mr. Martel defined very clearly there
20 what the idea behind habitat supply analysis is, that
21 those things do occur. That's not a question. They
22 occur somewhere doing the rotation.

23 The implication is, however, that you can
24 make them happen where you want them to happen. You
25 can somehow in some cases produce what you want, where

1 you want it and when you want it and be able to control
2 that.

3 To use the example of, say, recreation.
4 If I have a recreation -- in the U.S., if I had
5 recreational concession and cabins and that sort of
6 thing sitting there and they completely surrounded them
7 with a clearcut, I assure you that those same
8 conditions will probably occur elsewhere within the
9 area at some time, but I'm going to be a little bit
10 unhappy about what happened in the short term.

11 So we can actually be able to control the
12 size and spacing and occurrence and sometimes predict
13 rather closely what we would expect to come out of the
14 system. Given that it does occur somewhere during the
15 process, the only alteration is that one tries to
16 control that.

17 Q. All right. Next, Dr. Thomas, I would
18 like to take to you a question or perhaps it would be
19 better characterized as a proposition that Mr. Freidin
20 put to the witnesses during our Panel 4, Mr. Neave and
21 Dr. Quinney. It is taken from page 60453 of the
22 transcript and Mr. Freidin states, and I quote:

23 "I am suggesting there are a lot of
24 factors which affect those things which
25 make it misleading. It is irresponsible,

1 I believe, to tell the public at day one
2 that such a prediction has got any useful
3 purpose at all when you are talking about
4 those sort of things."

5 Generally can I ask you whether or not
6 you agree or disagree with Mr. Freidin's comment and
7 his proposition that it is irresponsible to say today
8 what your predictions are over the period of time you
9 are considering necessary in the application of a
10 habitat supply analysis model?

11 MR. FREIDIN: Why don't you tell Dr.
12 Thomas the particular objectives that I was suggesting
13 were irresponsible.

14 MR. O'LEARY: Without going several pages
15 through the materials, Mr. Freidin referred to
16 population levels, he referred to the four featured
17 species which the Coalition has recommended in the
18 forest, he referred to aesthetics, canoeing, camping,
19 viewing, fishing, hunting and that would appear to be
20 it.

21 Q. In the context of those comments, do
22 you have a view as to whether or not it is
23 irresponsible to make such predictions?

24 DR. THOMAS: A. I can only respond in
25 the general context of the United States. We are

1 expected to make such projections. We would consider
2 it irresponsible not to make such projections because
3 unless we had made such projections we would not have
4 considered the multiple outputs that are required by
5 our laws.

6 That's the U.S. condition. I am not sure
7 what that means in Ontario.

8 MADAM CHAIR: Excuse me, Dr. Thomas. I
9 don't want to use too much time on this because I am
10 sure Mr. Freidin will be cross-examining on this point,
11 but the Board recalls in that particular questioning
12 the concern was about how specific you can be in
13 pinning down, for example, the number of viewing
14 opportunities that might be available to the public in
15 a geographical location over a rotation age of 80 or
16 100 hundred years, and in the United States do you
17 actually say, we can tell you that you will have --
18 let's use camping sites because I can't really
19 understand completely viewing opportunities, but will
20 you write down on paper in your plan over the next 80
21 years three dozen camping sites will continue to be
22 operated on a specific geographical location?

23 DR. THOMAS: We might. On the other
24 hand, the quantification may be much less precise than
25 that, but that's not an absence of predictability. It

1 is an absence of precision.

2 The more precision one institutes in
3 anything the more expensive it is and in some cases the
4 more misleading it may be, but we do state outputs in
5 quantifiable terms, but the level of precision will
6 vary from one to the other.

7 Obviously, the less certain we are of our
8 predictability the less specific we are in terms of
9 quantification. I think I told you yesterday there is
10 a difference between saying I will provide 20,000 elk
11 period or I will provide elk somewhere between 15,000
12 and 25,000 or that I will sustain a certain point on a
13 trend line that I will encounter -- I will set my
14 objective of maintaining one elk per mile of transect
15 line on standardized aerial flights.

16 So there are different ways that one can
17 quantify that become less and less specific.

18 MADAM CHAIR: Who makes the judgment and
19 how do they make it about the level of quantification
20 that will be set?

21 DR. THOMAS: We would make it on the
22 basis of what we considered rationale to be able to
23 predict given current technology.

24 We would consider how much money we have
25 to spend in that way. We would consider what would be

1 satisfactory to our state counterparts that handle
2 animals. We would project that to the public of how we
3 were going to do it, and in the end we would have to go
4 through our budgeting processes to say we may give them
5 alternatives; we will do it at this level for this much
6 money, this level, this level.

7 So one can quantify, but in each level of
8 intensity it cost more and more dollars and at some
9 point you being to wonder: Am I willing to take a 1 of
10 9 chance -- I'm sorry, 1 out of 10 chance of being
11 wrong, am I willing to take a 1 out of 5 chance of
12 being wrong or 1 out of 3 chance. Each one of those is
13 dramatically cheaper to do. So all of those come into
14 consideration when we are quantifying our objectives.

15 MADAM CHAIR: Who makes the decision
16 about that?

17 DR. THOMAS: Ultimately what we call line
18 manager. We are organized on what we call line and
19 staff. The line officers are the ones that have
20 ultimate direct responsibility for varying levels of
21 areas of the forest. They are called line officers.
22 People who give them advice and do their chores for
23 them are staff. The line officers have to make the
24 decisions.

25 Now, the decision can be made -- some

1 decisions are deferred to the lowest line officer at
2 the district level, some of them are made by the chief
3 of the Forest Service: We will do it this way.

4 MR. MARTEL: I think you indicated
5 yesterday, though, the longer the term for the
6 projection, that because you have -- was is it a
7 10-year review?

8 DR. THOMAS: Yes.

9 MR. MARTEL: That adjustments are made.
10 How specific can you be, then?

11 I mean, is the first run at it -- let's
12 say for the 80 years, let's say for a rotation, how
13 specific or is it almost a guesstimate that you are
14 going to have 27 viewing sites 80 years from now and
15 you put that there as a figure to work with, but you
16 make the adjustments on a 10-year basis to accommodate
17 the real world?

18 DR. THOMAS: Yes. We make 10 year
19 adjustments in the overall plan. We make year-to-year
20 or day-to-day adjustments at the local level. If we
21 have a fire, we have an insect outbreak, we see that we
22 are doing something that's wrong, we will make those
23 adjustments immediately. We produce a formalized plan
24 every 10 years.

25 Now, very clearly the projection about

1 what will happen tomorrow is much more apt to be
2 precise than the projection of what will happen in one
3 hundred years.

4 To put it in human terms, I am fairly
5 certain that I will wake up in the morning, I am less
6 certain that I will make up one year from now and a lot
7 less certain that I will wake up 10 years from now and
8 almost certainly I won't wake up 25 years from now, at
9 least not here or wherever I happen to be at the
10 moment.

11 MR. O'LEARY: Not at the hotel where he
12 has been for the last three nights anyways.

13 DR. THOMAS: But the point that I am
14 making is the shorter the projection the more apt you
15 are to be right.

16 You have a vision in the long term and an
17 objective of where you are going which is adjusted
18 periodically for new information for the circumstances,
19 but the shorter-term projections are almost invariably
20 more accurate than the longer term and the longer the
21 term -- you know, you don't know what will happen, for
22 example, 50 years out in terms of the new technology,
23 in terms of demand, in terms of the economic realities,
24 in terms of long-term cumulative effects. Those things
25 are -- the futher out you are the shakier you get, but

1 you have a vision and you have an objective.

2 MR. O'LEARY: Q. Can you tell us, Dr.

3 Thomas, whether these decisions are appealable and, if
4 so, what impact that would have on the objectives that
5 are set?

6 DR. THOMAS: A. Yes. Once we have an
7 operating mechanism all of our operations are
8 appealable that are our internal decision. The citizen
9 who appeals must exhaust the legal appeal process
10 internal to the government before they can move on to
11 court.

12 So those decisions -- all decision can be
13 appealed that require an environmental analysis and
14 they can only be appealed on the basis of they are
15 not -- they are either not in compliance with the law
16 or not in compliance with the plan.

17 If the appeal is upheld, we go back
18 internally and we -- and many of them are. We go back
19 and adjust and meet that requirement. If they exhaust
20 their appeal, which I believe is two levels above the
21 decision officer, they can sue in the court and the
22 court can decide whether we are right or wrong.

23 DR. PAGE: A. Many of those same issues
24 are the reasons why when the five-year plans are
25 updated or resubmitted every year in British Columbia

1 there can be substantial changes.

2 DR. THOMAS: A. The real difference in
3 that, Mr. Martel, is that it may look one way on a
4 LANDSAT photo, it may look one way on a high altitude
5 photo.

6 When one gets out there and starts
7 looking where to put the road or where those timber
8 sales are actually going to go and you begin to look at
9 it in detail you will almost invariably require
10 adjustment of some degree from what you assumed from a
11 distance and it has to be flexible to account for that.
12 That's what our ID, our interdisciplinary teams are
13 for.

14 Q. Finally, Dr. Thomas, given all that
15 we have heard over the last several days in your
16 evidence I was wondering whether or not you had a
17 message that you would like to leave with the parties
18 and the Board in respect of the areas that have been
19 discussed?

20 A. Yes. I think if I were to leave a
21 message the one that I would like to leave is the fact
22 that tritely everything is connected to everything else
23 and there is no free lunch.

24 Two, we are required to look ahead. We
25 do in our personal lives, we do in our timber planning

1 and we can in our wildlife and other aspects of the
2 situation. We need to be prepared to adjust to new
3 technology and changing circumstances.

4 Either the unwillingness or inability to
5 face these things upfront the problems will accumulate,
6 I can almost promise you, and when you then have to
7 address the emerging problems at a later date once the
8 options have been removed that adjustment, if it is
9 indeed made, will be much more difficult and much more
10 expensive than having to do it earlier when you have
11 more options or reaction. At least that's been our
12 experience.

13 MR. O'LEARY: Thank you, gentlemen.

14 Madam Chair, that is the
15 evidence-in-chief.

16 MADAM CHAIR: One further question before
17 we begin with the cross-examination, Dr. Thomas, and
18 that is you have repeated a number -- you have repeated
19 several times your belief that there should be the
20 statement of a vision in timber management planning,
21 that it is not enough to say we are going to do this
22 next year and this five years from now, but there has
23 to be a longer term vision.

24 Can you point the Board to a statement of
25 that kind of vision in a plan that you have done or

1 some sort of plan that you think is a good example of
2 explaining what a vision is with respect to timber
3 management planning?

4 DR. THOMAS: I can't do it off the top of
5 my head. First, I don't want to mislead you. I am a
6 recent scientist. I don't actually do forest plans,
7 even though I am very familiar and helped with a
8 number, but we have a national vision statement which I
9 will be happy to send in after I get home.

10 We have a vision statement. Ordinarily
11 those are stated upfront in the plan of what they
12 visualize as a longer term outcome. We begin to
13 capsulize that under the idea of the statement of
14 future desired condition. That's a relatively new
15 insertion into our planning operation.

16 We have been thinking about that sort of
17 thing for a long time, but that seems to be a rather
18 good summary description, future desired condition,
19 explain exactly what you expect you want your future
20 condition to be and in that sense that's a vision
21 statement, too.

22 MADAM CHAIR: The Board would appreciate
23 it if you could send us an example of both those types
24 of statements.

25 DR. THOMAS: If you will describe exactly

1 to my friends over there what you want I will see that
2 you get it.

3 MADAM CHAIR: That's fine.

4 Mr. Beram, will you discuss that with Mr.
5 O'Leary.

6 MR. BERAM: (nodding affirmatively)

7 MADAM CHAIR: Thank you.

8 Mr. Lindgren?

9 MR. LINDGREN: Thank you, Madam Chair.

10 Good morning, gentlemen. My name is
11 Richard Lindgren. I am counsel for Forests for
12 Tomorrow which is a coalition of conservation groups in
13 Ontario and I have a few questions arising out of your
14 evidence.

15 CROSS-EXAMINATION BY MR. LINDGREN:

16 Q. Dr. Thomas, I have reviewed your CV.
17 It seems that you have done a fair amount of writing
18 and research with Mr. Chris Maser; is that right?

19 DR. THOMAS: A. Yes. He and I have
20 copublished a number of articles.

21 Q. Are you aware that Mr. Maser
22 testified before this Board last year?

23 A. Yes.

24 Q. Now, he prepared a witness statement
25 on sustainable forestry and old growth management and

1 it is not referenced in the list of exhibits that you
2 have reviewed and I am wondering if you had an
3 opportunity to read that witness statement?

4 A. I have read three extracted pages
5 from that witness statement.

6 Q. But not the witness in its entirety?

7 A. Not in total.

8 Q. Okay. Dr. Page and Mr. Patch, did
9 you read Chris Maser's witness statement?

10 DR. PAGE: A. I have not seen it, no.

11 MR. PATCH: A. I did not, no.

12 Q. Now, Last year my client also filed a
13 witness statement on landscape management and planning
14 for biodiversity on wildlife.

15 Dr. Thomas, did you have an opportunity
16 to review that witness statement?

17 DR. THOMAS: A. Whose witness statement?

18 Q. Forests for Tomorrow witness
19 statement No. 9.

20 A. Not that I recall.

21 Q. Dr. Page or Mr. Patch, did you have
22 an opportunity to review that.

23 DR. PAGE: A. No, I haven't seen that
24 one.

25 MR. PATCH: A. No.

1 Q. Okay. Then, finally, Forests for
2 Tomorrow also filed a witness statement on integrated
3 forest management and that was prepared by Mr. Zane
4 Gray Smith who is a regional forester or was a regional
5 forester with the U.S. Forest Service.

6 Dr. Thomas, did you read that?

7 DR. THOMAS: A. No.

8 Q. Dr. Page or Mr. Patch?

9 DR. PAGE: A. No.

10 MR. PATCH: A. No.

11 Q. Thank you. Now, Dr. Thomas,
12 throughout your evidence you have been talking about
13 the need to integrate timber and wildlife objectives
14 within the same plan, and I take it by wildlife you are
15 referring to all species of flora and fauna and other
16 organisms, not just big game species?

17 DR. THOMAS: A. Primarily in my mind
18 when I was talking I included all vertebrates.

19 Certainly within our plan we do not
20 consider in the U.S. plants ordinarily as part of
21 wildlife, but that's -- or certainly part of our
22 planning process because they are covered under our
23 Endangered Species Act. We have requirements under the
24 regulations of the National Forest Management Act in
25 terms of retention of plant diversity.

1 Q. Thank you. I understand that in the
2 U.S. national forest planning process the integration
3 of timber and wildlife objectives is achieved through
4 forest management planning not timber management
5 planning?

6 A. That's correct.

7 Q. Okay. On that point I would like to
8 refer you to some of the interrogatories that were
9 filed in connection with this panel. This is Exhibit
10 2099. Do you have that document?

11 A. No, not in front of me. Maybe I do.
12 Do I have this document?

13 MR. PATCH: A. FFT interrogatory for
14 Panel 7?

15 Q. Actually I am going to start by
16 referring to the Ontario Forest Industry Association
17 interrogatory No. 6 which is found on page 21.

18 A. The question starts at the bottom of
19 page 20?

20 Q. That's correct.

21 A. All right.

22 Q. Now, the question at the bottom of
23 page 20 is:

24 "Where in the timber management planning
25 process should the other factors

1 controlling forest habitat be discussed
2 and planned?"

3 On top of page 21, the first paragraph
4 indicates that:

5 "The premise in the question is not
6 valid..." And it goes on to say that:
7 "The factors affecting wildlife
8 populations should be analysed when
9 habitat objectives are being
10 established."

11 I take it this is your answer, Dr.

12 Thomas?

13 MR. PATCH: A. This one was my answer.

14 Q. Okay. The question goes on to
15 read -- the answer reads:

16 "The process should not be a timber
17 management planning process. The forest
18 management planning process is the more
19 appropriate planning approach. Timber
20 management is only one aspect of
21 forest management. Wildlife concerns
22 including human utilization of wildlife
23 and targets for production should enter
24 the process at the outset, otherwise
25 wildlife and other concerns will never

1 receive adequate attention. The U.S.
2 Forest Service had to learn this lesson
3 the hard way."

4 Did you draft that, Dr. Thomas?

5 DR. THOMAS: A. The second paragraph is
6 mine I think.

7 MR. PATCH: A. The first one was mine.

8 Q. My question then is to Dr. Thomas.
9 What exactly do you mean by forest manager planning and
10 why is that preferable to timber management planning?

11 DR. THOMAS: A. Under our laws in the
12 United States we are required under the Multiple Use
13 Sustained Yield Act to consider other outputs from the
14 forest than wood products.

15 Among those are wildlife, water,
16 recreation and forage or lifestyle grazing which is
17 what it really amounts to. In our -- so that's our
18 requirement. So when we have a forest management plan
19 we address all of those issues at that time and we are
20 beginning to learn to state those as objectives.

21 So we have forest management. Timber
22 management is a subset under forest management in that
23 we do prepare timber management plans that may have a
24 multiple output objective which is production of elk
25 habitat or maintenance of "x" amount of pileated

1 woodpecker habitat or whatever those wildlife
2 objectives might be.

3 The timber management plan is one aspect
4 and that's the process usually of planning on how we
5 will remove, regenerate and access timber.

6 Q. Okay. Now, on the issue of multiple
7 use, can I refer you to another interrogatory. This is
8 industry interrogatory No. 10(a) found at page 23.

9 In the answer you refer to the multiple
10 use requirements imposed upon the Forest Service by law
11 and you go on to indicate, that:

12 "The Forest Service at one time
13 essentially pursued planning using timber
14 management plans constrained by other
15 concerns such as wildlife. This led to a
16 situation where planning became an
17 exercise between adversaries (i.e.
18 foresters versus biologist, hydrologists
19 versus forester). These adversarial
20 relationships quickly spread into the
21 political and legal arenas. As a
22 consequence some of the most productive
23 forest lands in North America were barred
24 from timber harvest until appropriately
25 balanced forest management plans were

1 devised."

2 In a nutshell, Dr. Thomas, is this
3 essentially the reason why the U.S. Forest Service
4 practises forest management instead of timber
5 management?

6 A. Yes. I don't think conceptually we
7 ever visualized we were doing anything else but forest
8 management, but we obviously recognized somewhere in
9 the process that our timber targets were overriding and
10 that we were using constraint management on timber
11 output and that produced those conflicts that I
12 described. We have now evolved into forest -- more of
13 a concept of forest management. That process is
14 ongoing.

15 Q. But as we have heard, forest
16 management itself has not eliminated all of the
17 conflicts, there are still appeals, there are still
18 court challenges?

19 A. Yes.

20 Q. But is it realistic to expect that
21 all of the conflict there can be eliminated regardless
22 of timber management or forest management?

23 A. No, I suspect that at least for the
24 remainder of my professional career, the millinea -- at
25 the arrival of millinea everything may become

1 non-controversial, but I expect at least for the
2 immediate future there will always be conflict. There
3 is always conflict in human affairs and it is a matter
4 of how we resolve and address those conflicts that is
5 evolve as well.

6 For example, I think I stated earlier
7 some time ago we got sued more frequently and appealed
8 more frequently -- I think we are still getting
9 appealed at the same rate or greater, but when those
10 appeals turned into lawsuits it was more frequent and
11 we most frequently lost.

12 That has now turned around where the
13 appeals are less frequently upheld and when elevated to
14 court action we less frequently lose. So it's a matter
15 of defining the playing field I think.

16 Q. In terms of defining the playing
17 field, I think you have indicated several times that
18 what you are trying do now is at least narrow the range
19 of the dispute.

20 Keeping that comment in mind, can we
21 agree as a general proposition that a public forest
22 manager is more likely to narrow the conflict or
23 minimize the conflict and at the same time achieve
24 multiple use objectives through forest management
25 planning as opposed to timber management planning?

1 A. I would agree with that.

2 Q. Thank you. Under forest management
3 planning, the public land -- or the public forest
4 manager can see produce a continuous and predictable
5 supply of wood to the industry; is that correct?

6 A. Continuous, yes. I do not want to
7 mislead you, however, that given how the situation has
8 evolved in the United States that wood is now being
9 produced at far below what we call biological potential
10 in view of the fact that we have multiple objectives
11 and we are producing those multiple objectives in many
12 cases after we had seriously made serious inroads on
13 our options. So these things do not come free.

14 They are multiple, but we have found that
15 where we have the most options we can adjust most
16 rapidly and with least effect in the output of wood
17 where we have to adjust because of the depletion of
18 options it is an expensive situation to come back on
19 schedule.

20 Once we are under full regulation, given
21 appropriate multiple outputs, the costs are much less
22 than having to recover from other management action.

23 Q. Aside from the historical legacy,
24 using forest management planning the manager can
25 produce wood for industry, recreation for

1 recreationalists, wilderness for wilderness advocates
2 and so forth, all of that can be produced under the
3 forest management planning process?

4 A. In my opinion, yes.

5 Q. Now, if the public wanted those kinds
6 of forest-based benefits to be produced; namely timber,
7 wildlife and recreation and wilderness, and if you were
8 the manager who was charge with delivering those
9 multiple inputs, I take it that you would prefer to use
10 integrate forest management as opposed to timber with
11 constraints?

12 A. I would much prefer the second to the
13 first. Integrated forest management would be my
14 preference.

15 Q. Okay. Now, yesterday Madam Chair
16 indicated that apparently one-third of the American
17 wood supply currently comes from the U.S. national
18 forest which presumably allows you -- or makes it
19 easier for you to to practise forest management.

20 I think in your answer you indicated that
21 in some regions there is increasing pressure on the
22 national forest because of the shortfall on private
23 land.

24 Leaving all of that aside, if most of the
25 wood in the United States came from public lands, such

1 as U.S. national forests, would you change your mind
2 about the need to practise integrated forest
3 management?

4 In other words, would you go back to
5 timber management with constraint or would you still
6 practise forest management?

7 A. I would certainly practise forest
8 management. I even think the more progressive private
9 corporations in the United States consider their
10 management in that light.

11 Q. Okay, thank you. Can I refer you
12 back to page 23 of the interrogatories on the issue of
13 constraints. Question No. 10(c) from the industry
14 asked:

15 "Does the establishment of the wilderness
16 areas, roadless areas and no-cut buffers
17 constitute a form of constraint
18 management?"

19 In your answer towards the bottom of page
20 23, you say:

21 "If you view timber management as the
22 primary purpose of forest management,
23 then wilderness and buffer strips can be
24 considered forms of constraint
25 management. Obviously such a view can be

1 reversed by considering wilderness or
2 water and the products of aquatic
3 ecosystems as joint benefits to be
4 derived from the forest. In that case...
5 some level of timber management would be
6 viewed as a form of constraint to
7 achieving these non-timber objectives."

8 I have a few questions based on that
9 statement. First of all, can you tell me, whether or
10 not in your opinion is there any value associated with
11 setting aside wilderness areas and no-cut buffers
12 strips?

13 A. No.

14 Q. What are those advantages or values?

15 A. Well, in the sense of wilderness,
16 there are two ways to come at that. In one sense, many
17 of our wilderness areas are not highly productive areas
18 in terms of timber; the terrain is steep, the situation
19 is tough.

20 That's a land allocation that we would
21 perhaps have made just because it was too expensive and
22 too risky to enter for timber management purposes.
23 That's not altogether true. There are other
24 wildernesses that are highly productive, but
25 essentially that's an allocation that a wilderness buff

1 can consider from a number of aspects. One is
2 aesthetics, one is a recreation area, many ecologists
3 consider them as ecological reserves.

4 But for whatever reason we have chosen in
5 the U.S. to set aside some extensive areas for
6 wilderness for all of those reasons and each person who
7 has advocated it advocates it from a different point,
8 but in culmination of all of those reasons we have set
9 aside a large amount of wilderness.

10 I spend a lot of time in the wilderness
11 myself because I find it both interesting ecologically,
12 the solitude is interesting and where else can I get on
13 my horse with a packstring and be gone for a week and
14 not run into anyone else.

15 DR. PAGE: A. If I could add something
16 to that, Mr. Lindgren. The British Columbia Forest
17 Service has just released a wilderness plan for the
18 90s. We are recognizing the public demands for
19 wilderness. We decided to identify those areas, the
20 Forest Service voluntarily, we consider as wilderness
21 with minimal constraints on the timber supply.

22 Q. Okay, thank you.

23 DR. THOMAS: A. I think the point I was
24 trying to make there, however, is that if you use
25 constraint management you can look through two ends of

1 the tube. Who is being constrained?

2 If you can look at it as a desirable
3 multiple output it's a whole different view and
4 constraints aggravate the heck out of people that are
5 trying to make something work. If it is recognized not
6 as a constraint but as a desirable product it is a
7 whole different view that makes the world an easier
8 place.

9 Q. Now, the question also referred to
10 roadless areas, but in your answer you don't refer to
11 roadless areas.

12 When Mr. Zane Gray Smith was here he
13 talked about the roadless area evaluation program
14 that's been carried out in the United States. I am not
15 going to ask you about that. I am just simply going to
16 ask you whether or not there is any value associated
17 with keeping some forested areas roadless?

18 A. Yes, for a myriad of reasons. We
19 keep some areas roadless because the watersheds in
20 which we would road are extremely fragile in terms of
21 their soil and that we might receive very adverse
22 effects in the hydrologist -- in the view of the
23 hydrologist.

24 There are other areas. A roadless
25 functions -- the only reason we know the difference

1 between a roadless area basically at its ultimate level
2 in the wilderness is because we define one one way and
3 define the other another way.

4 However, we do have roadless areas in
5 which we do manage timber and we extract it via
6 helicopter or some other means of low impact
7 extraction.

8 So there can be a number of reasons one
9 has a roadless area all the way from the fact that it
10 is just, at least at the present moment, far, far too
11 expensive to build the access roads to extract the
12 material.

13 So when you talk about roadless areas you
14 run across an entire spectrum of feasibility for entry.
15 In some cases they are reserved for a particular reason
16 and in others just because it's not economically
17 feasible to enter them.

18 Q. Now, at several points in your
19 testimony this morning you talked about roads and road
20 impacts and I want to ask you simply this, are there
21 any significant or adverse wildlife impacts associated
22 with the construction and use and maintenance of access
23 roads and road networks? If there are can you give a
24 few examples.

25 A. I will give you a few examples.

1 Starting at the very lowest level, there are people,
2 though I can't imagine why, I don't want to do it -- I
3 am making a joke.

4 There are some people that study
5 salamanders, small forest creatures that evidently are
6 impeded from movement by roads.

7 If you move up to the top end of the
8 scale, say with elk, for example, one of the primary
9 factors in nearly every habitat evaluation model for
10 elk is the road density per square mile and the fact
11 that at least the studies that have been done to date
12 indicate that there is a lesser use of the habitat
13 adjacent to the road increasing as one moves away from
14 the road and I believe that ranges out to about 400
15 metres, 3- to 400 metres of reduced habitat use.

16 So there's two examples.

17 Q. Okay, thank you.

18 A. I would go a little bit further.

19 That may not be as significant as it seems if that is
20 not intended -- that road density does not impinge on
21 achieving the population objectives.

22 If the objective is 100 and one obtains
23 100 and there is no habitat damage, that's a
24 satisfaction of the objective. If the potential
25 without roads was 300 and you had an objective of 300,

1 then you would a negative impact.

2 The objective can be judged two ways --
3 the impact is judged two ways. One in the inability to
4 meet the objective and the other is to meet the
5 biological potential. Almost always a multiple
6 objective does not achieve the biological potential of
7 any one of the individual outputs. So you go through
8 what we call optimization.

9 Q. If I could, I would like to move
10 briefly from access roads to harvest and impacts on
11 diversity.

12 Yesterday I provided with a copy of an
13 excerpt from the transcript relating to Mr. Maser's
14 evidence. did you have an opportunity to read that?

15 A. Yes, I did.

16 MR. LINDGREN: Madam Chair, this is from
17 Volume 283 of the transcript and I do have copies for
18 the parties.

19 MADAM CHAIR: Thank you, Mr. Lindgren.

20 MR. LINDGREN: Q. The first question I
21 would like to put to you relates to the question that
22 we heard this morning from Mr. Martel which was when is
23 the clearcut too big, and on that issue I would like to
24 refer you to page 50608?

25 DR. THOMAS: A. Of what?

1 Q. Do you not have the transcript?

2 A. I'm sorry, 50,000 and what?

3 Q. 608.

4 Q. My gosh. Are you guys going to read
5 all of this?

6 All right. I'm ready.

7 MR. MARTEL: That's a year ago.

8 MR. LINDGREN: Q. Now, at line 20 we see
9 a question that I put to Mr. Maser, and I said:

10 "On the issue of clearcut size this Board
11 has heard evidence in FFT Panel 5 that
12 there are large individual clearcuts in
13 this province ranging up to several
14 thousand hectares in size. The Board has
15 also heard about some large contiguous
16 cut-overs, one in particular that may be
17 up to 269,000 hectares."

18 My question is:

19 "From a wildlife site productivity and
20 biodiversity perspective do you have any
21 ecological concerns about clearcuts of
22 that magnitude?"

23 Mr. Maser answers:

24 "If you have a clearcut that is that size
25 and that scale the diversity has

1 essentially been eliminated. I mean,
2 what you have done is take a forest and
3 convert it to an opening and that depends
4 on whether there are islands and
5 stringers. "

6 He goes on to talk about impacts on
7 genetic diversity and structural diversity.

8 My question to you, Dr. Thomas, is simply
9 this, do you share any similar concerns about the
10 biodiversity impacts of cut-overs of that magnitude?

11 DR. THOMAS: A. I certainly would have a
12 concern about a 269,000 hectare clearcut, yes. I
13 suspect anybody would.

14 Q. Do you have a concern about
15 individual clearcuts that range in size of up to
16 several thousand hectares?

17 A. You are beginning to approach a
18 margin. At that point I would to know what the
19 objective of the management was.

20 If I sit here and think a minute I can
21 probably think why that might be quite rationale,
22 particularly if we were aiming towards species -- this
23 is totally hypothetical. I don't want to address this
24 in Ontario because I'm not familiar with the
25 circumstances.

1 There are two attributes to diversity.

2 One is the structure, but also one of the great
3 attributes is stand size or forest size. If you are
4 dealing with a species, for example, that's associated
5 with a particular habitat condition, say the one that I
6 am obsessed with at the moment, the northern spotted
7 owl, and you are in the north cascades and you are
8 dealing with a 4,000-acre home range and you wanted a
9 cluster of 20 pairs ultimately, then one would begin to
10 think about a large relatively contiguous, relatively
11 similar blocks of habitat.

12 So it all depends on the objective of the
13 species in question.

14 Q. Would you have any objection if this
15 Board were to impose certain requirements with respect
16 to clearcut size or configuration, but leaving the door
17 open for biological exceptions for the reasons that you
18 have just outlined? Would that be a reasonable
19 approach?

20 A. I think I would probably as an
21 American defer that this Board can make whatever
22 decision they choose to make in the Canadian context.

23 However, there is nothing wrong with the
24 limitation per se if it is not -- if it is in keeping
25 with the objectives that one wishes to accomplish.

1 I think if you go at it the other way
2 around, that you have appropriately jointly stated
3 objectives, the size of the regeneration units will
4 emerge from those joint objectives.

5 Q. Okay.

6 A. There may be -- I think in some cases
7 we confuse biological arguments with aesthetic
8 arguments and what may not be acceptable to the public
9 because of size or appearance may be quite acceptable
10 in a biological sense given the objectives, and I hope
11 they would be joint objectives. I think it would
12 emerge from that.

13 However, I think one would quickly find
14 they would adjust their management if we came to joint
15 production operations that required for some reason
16 very large clearcuts and we did it. I think the
17 decision space would immediately would begin to be
18 constrained because of aesthetics which would a
19 different question.

20 Q. So if I understand you correctly
21 then, Dr. Thomas, if truly integrated forest management
22 was being practised there might be less of a need for
23 arbitrary limits and requirements?

24 A. I would rather -- yes. I would
25 rather see the results that emerge from truly

1 integrated forest management with multiple objectives
2 than I had artificial imposition of constraints. The
3 constraints if they are such and are considered as such
4 should emerge from that integrated operation.

5 Q. Okay.

6 MR. MARTEL: If you were going to -- I
7 understand that caribou need very large clearcut I
8 guess with lichen, a lot of it around, there seems to
9 be a concern that if one tries to manage for that the
10 clearcut becomes larger than some people would desire
11 it. How does one get around that objection?

12 DR. THOMAS: The only caribou I ever saw
13 in my life was out of a bus or out of an airplane. I
14 am going to defer to someone who knows about caribou.

15 MR. MARTEL: All right.

16 DR. PAGE: I have worked on caribou in
17 Ontario as well as other places and that's one of those
18 clear issues where limitation, either cut block sizes
19 requiring to be large or required to be small could
20 clearly not meet multiple objectives.

21 If moose require, which they do, smaller
22 block sizes of habitat and caribou require
23 substantially larger sizes of habitat, then it will be
24 impossible to do both simultaneously in the same area.

25 Caribou I believe undoubtedly do require

1 very large blocks that must be burned in order to
2 generate lichens as opposed to shrubs.

3 MR. MARTEL: Hard to sell?

4 DR. PAGE: It depends on the reasons that
5 you give. If it is I think clearly demonstrated to the
6 public, in some cases that means direction of signs as
7 they enter areas, what your reason for your management
8 intervention is they can understand that and certainly
9 if the public aware of the need to provide suitable
10 habitat and the reasons for large cut blocks they are
11 more acceptable. It doesn't mean that all the
12 opposition will disappear.

13 MR. LINDGREN: Q. Yesterday, Dr. Thomas,
14 you indicated that when the U.S. Forest Service is
15 coming up with an appropriate forest management plan
16 the Service identifies and analyses at least five or
17 six different alternatives ranging from low production
18 to high production and so forth.

19 You went on to say that the tradeoffs are
20 made within a certain framework of underlying
21 requirements. I take it that you must be referring to
22 requirements under the National Forest Management Act
23 of the regulations?

24 DR. THOMAS: A. And other acts; Multiple
25 Use Sustained Yield Act, Clean Water Act, Wilderness

1 Act.

2 This comes down to what I was trying to
3 tell you yesterday that because I think we did not
4 respond quickly enough we now have a broad array of
5 legislation that we must respond to and what we are
6 dealing with now, for example, the spotted owl issue is
7 essentially a collision between two or three acts that
8 are coming into conflict.

9 Yes, we have the underlying requirements
10 of law that we must satisfy. We cannot present an
11 alternative that's illegal.

12 Q. One of the requirements of law is the
13 requirement to plan for diversity, correct?

14 A. Underlying. That's not a clear
15 objective in American law. There is a requirement of
16 the National Forest Management Act to sustain the
17 diversity of tree species. That's the only mention of
18 the word diversity.

19 There is a regulation within the National
20 Forest Management Act that says we must retain viable
21 populations of all vertebrate species. Then there is a
22 requirement in the Endangered Species Act that we not
23 make species threatened or endangered and that in
24 response to an endangerment or a threatening situation
25 we must provide the habitat which is the underlying

1 ecosystem that supports that species, but there is no
2 direct requirement in American law for diversity.

3 Q. I will come to that in minute, but of
4 the various requirements that you have just identified,
5 do you agree with or support those requirements?

6 A. As a biologist, yes, I do.

7 Q. Is there a difference between --
8 perhaps you can explain it to me. Can you explain the
9 difference between maintaining diversity of vertebrate
10 species and maintaining overall biological diversity?

11 A. I think one would run into the other.
12 I was merely trying to make the point that there is no
13 direct requirement for diversity per se. If you add up
14 the requirements in American law for the Forest Service
15 I think diversity emerges from that.

16 Q. All right.

17 MR. LINDGREN: Madam Chair, I am in your
18 hands, but we can break now. I have approximately 20
19 to 30 more minutes.

20 MADAM CHAIR: We will have lunch now, Mr.
21 Lindgren, and we will be back at 1:30.

22 MR. LINDGREN: Thank you.

23 ---Luncheon recess at 12:00 p.m.

24 ---On resuming at 1:35 p.m.

25 MADAM CHAIR: Please be seated.

1 Mr. Lindgren?

2 MR. LINDGREN: Thank you, Madam Chair.

3 Q. Dr. Thomas, yesterday I provided you
4 with a copy of an article entitled Research on Wildlife
5 in Old-Growth Forests: Setting the Stage. Do you have
6 a copy of that?

7 DR. THOMAS: A. I do.

8 Q. Did you write that?

9 A. Yes, I did.

10 Q. All right.

11 MR. LINDGREN: I would like to file that
12 as the next exhibit, Madam Chair.

13 MADAM CHAIR: This will become Exhibit
14 2107 and the title is Research on Wildlife in
15 Old-Growth Forests: Setting the Stage, and the author
16 is Dr. Thomas and the date of this...

17 MR. LINDGREN: It is found in a document
18 entitled Wildlife and Vegetation of Unmanaged Douglas
19 Fir Forests and it is dated May 1991. It is
20 publication of the U.S. Forest Service.

21 MADAM CHAIR: Thank you.

22 ---EXHIBIT NO. 2107: Document entitled Research on
23 Wildlife in Old-Growth Forests:
24 Setting the Stage, authored by
Dr. Thomas, dated May 1991.

25 MR. LINDGREN: Q. Dr. Thomas, could I

1 ask you to turn to page 2 of this exhibit. On the
2 left-hand column at the bottom of the page we see a
3 statement that:

4 "Maintaining biological diversity as an
5 overriding goal for federal land
6 management has played an important role
7 in the evolution of law and thought about
8 how land is to managed."

9 I would like to stop right there and ask
10 you this question. In your opinion should maintaining
11 biological diversity be the overall or paramount
12 objective of public land management?

13 DR. THOMAS: A. No.

14 Q. Okay. Should we be undertaking any
15 activities that result in the loss of biological
16 diversity?

17 A. That all depends. Could I answer the
18 question by saying that I think maintenance of
19 biological diversity is an appropriate goal, but one
20 can take it to the extremes of whether you are talking
21 about the life or death of a nation or I can think of
22 extreme examples when maintenance of biological
23 diversity might be overridden.

24 For example, in the United States we have
25 a provision under the Endangered Species Act where

1 under severe circumstances the act can be overridden
2 which would mean that under our law it's possible under
3 appropriate circumstances to lessen our concern with
4 biological diversity.

5 As a biologist I think biological
6 diversity it a worthy goal. I think it is a goal that
7 would underpin long-term sustainability of forest
8 resource and other resource management.

9 Q. In normal circumstances then, Dr.
10 Thomas, can we agree that timber management activities
11 or forest management activities should only be approved
12 or undertaken if they are consistent with this overall
13 goal of maintaining biological diversity?

14 A. You have to differentiate that
15 question between biological theory and law. Under the
16 law that the U.S. forest operates we must maintain
17 biological diversity as a bottom-line objective.
18 Biologically it is desirable, but species do become
19 extinct. Some number per year.

20 Q. I want to be clear on your evidence
21 here. When you write in this article that biological
22 diversity has been an overriding goal of federal land
23 management, do you agree with that goal; namely,
24 maintaining biological diversity?

25 A. I believe that we should make every

1 attempt possible to maintain biological diversity.

2 Q. Thank you.

3 A. I just don't want to be confused
4 between my opinions and what the requirements of law
5 are. We are moving back and forth between the agency
6 and my personal opinion which may be quite different.

7 Q. Let me ask your opinion as a
8 professional biologist. If maintaining biodiversity is
9 an important and overall goal to be accomplished or
10 achieved, can we agree that normally biodiversity
11 should not be traded off against other forest benefits
12 such as securing a certain number of board feet at the
13 expense of a particular species?

14 A. As a general statement I would agree
15 with that. There may be exceptions.

16 Q. Thank you. Let me ask you about
17 making tradeoffs. I guess I would be remiss if I
18 didn't ask you about the spotted owl. Just a brief
19 question or two.

20 If a vocal segment of the public decided
21 that it would like to eliminate the spotted owl or
22 spotted owl habitat for the sake of securing a few more
23 jobs for a few more years should professional
24 biologists give effect to that wish?

25 A. It depends on whether the

1 professional biologist is in the decision-making
2 position.

3 The position that I occupied our analysis
4 was advisory and under American law the God squad --
5 there is a provision in the Endangered Species Act for
6 a committee called the endangered species committee
7 which we refer to as the God squad because they have
8 the ability to allow the extinction of a species.

9 That committee has been activated in this
10 particular case and has just gone -- not quite so long
11 as you folks have, but just went through a very long
12 series of evidentiary process and they are in the
13 process of contemplating whether they will grant
14 exceptions to recommendations to the U.S. Fish and
15 Wildlife Service concerning spotted owls. That's our
16 provision. There is a provision that we can decide to
17 take an increasing risk or we can decide to take a very
18 high risk or to let a species go depending on those
19 things.

20 If I was a decision maker I would
21 probably make the decision in a broad perspective. As
22 a biologist, I am not required to make that decision.
23 I am required to make the technical analysis.

24 Q. I guess what I am trying to get at is
25 the role of the public in terms of making those

1 tradeoffs. I guess I will put two scenarios to you.

2 The first is, suppose we had a segment of
3 the public that said: Eliminate the spotted owl,
4 should the professional land manager, the person making
5 the decision give effect to that wish?

6 A. First, nobody said that.

7 Q. That's correct, it is a hypothetical.

8 A. And the fact that nobody has said
9 that, even the people most affected, the answer is yes,
10 the decision maker is going to pay attention. Whether
11 or not they predicate their decision on that along with
12 a number of other things I don't know, but these
13 decisions don't come in isolation.

14 They come in biological fact, public
15 opinion, law, circumstance, status of the economy. All
16 of those things come to bear. If a biologist makes a
17 biological decision only the biology comes to bear,
18 then at a higher elevation other things come to bear.

19 Q. Let me give you the second scenario.
20 Although this seems unlikely let's suppose nobody said
21 anything about what should happen to the spotted owl or
22 some other forest dependent species, should the forest
23 manager unilaterally undertake steps that might
24 eliminate either the species or its habitat?

25 A. Again, it depends on the objective.

1 I think biodiversity is an underlying concept with
2 which I agree.

3 Individual species survival is part of
4 diversity. I also agree with that. I can also
5 conceive of situations where I might make an alternate
6 decision. I would not like to do it, I will avoid it
7 all possible cost or all reasonable cost, but there may
8 be exceptions.

9 Q. Okay. Could I ask you to return to
10 Exhibit 2107. Continuing with the same paragraph that
11 I just read to you, you state that:

12 "This evolving concern over biological
13 diversity encompasses retaining the
14 diversity of plant and animal life,
15 forest structure, human experience
16 related to the forest and its many forms
17 and an expansion of management concerns
18 from the immediate and the site specific
19 to long term considerations of changing
20 landscapes over time. These concerns
21 seem likely to be embodied in law and
22 regulation."

23 I want to ask you precisely which laws
24 and regulations are you referring to?

25 A. There is -- this is totally my

1 personal opinion, but the evolution in law in the
2 United States has been more and more and more toward
3 what seems to be a concern about preservation of
4 biodiversity.

5 The U.S. law on Endangered Species Act
6 will come up for renewal this year. I don't know what
7 will happen to it, but I believe that it will probably
8 be changed to incorporate a broader view of
9 biodiversity than a species-by-species consideration.

10 Simultaneously for the last three
11 sessions of the Congress there has been consideration
12 of a bill concerning biodiversity. It has not passed,
13 it has not really come out for a full scale debate, but
14 it takes a while for those things to surface. Whether
15 that will attended to in the revisions of the
16 Endangered Species Act, whether or not that bill will
17 ever come forward in its own right, it appears that the
18 next evolutionary step in law will be some stated --
19 more stated concerns with biodiversity. That's a
20 guess.

21 Q. Did you say at both the state and
22 federal level?

23 A. States are imposing such -- I don't
24 know of any state laws yet on biodiversity, but there
25 are state laws that parallel federal law dealing with

1 endangered species. So I think that if one were to
2 chase the evolution of law in the U.S. I think it's
3 trending in that direction, both state and federal.

4 Q. Okay. Now at the top of page 2 in
5 the right-hand column you discuss those potential
6 changes in law and regulation and you write that:

7 "New words and concerns reach the ear of
8 natural resource management professionals
9 and the scientific community with
10 increasing frequency. Biodiversity,
11 landscape ecology, conservation biology,
12 environmental ethics and new perspectives
13 in forestry, public forest managers are
14 becoming convinced that maintaining
15 biological diversity should be the
16 overriding and land use management
17 objective."

18 Now, if that is the overriding land use
19 management objective, can we agree that landscape level
20 management is going to be necessary in order to
21 maintain biodiversity and ensure viable populations?

22 A. Yes.

23 Q. Okay. In other words, what we have
24 to do at the landscape level is ensure an adequate
25 supply of functioning ecosystems across a landscape

1 over time?

2 A. Yes.

3 Q. And that's going to require certain
4 changes in practices and certain changes in philosophy,
5 correct?

6 A. It's going to require a change in the
7 way we do business largely at the scale with which we
8 view things. Instead of viewing all things at the site
9 scale, we will have to pull up and worry about how
10 things are arranged in the landscape pattern.

11 Q. And it is going to mean that we have
12 to do more than simply provide moose habitat or deer
13 habitat across the landscape?

14 A. The way you -- it depends on how one
15 formulates the management. If one is using appropriate
16 indicators, then they would be the mechanism at
17 landscape scale whereby we achieve those objectives.
18 If you concentrate merely on one species, I suspect it
19 would not satisfy biodiversity requirements.

20 Q. And you are certainly not advocating
21 focusing on a single species or two for the purposes of
22 maintaining biological diversity?

23 A. Certainly not.

24 MR. MARTEL: But you will get it through
25 legislated change, biodiversity, you think and

1 everything that flows from it?

2 DR. THOMAS: It appears that that is an
3 evolutionary trend, but all evolutionary trends end up
4 somewhere. They don't go on in one direction forever.

5 Actually, I think we are at a turning
6 point nationally in legislation, whether or not this is
7 the culmination of that trend. We could reconsider the
8 Endangered Species Act and go in the other direction,
9 but I think it is a point that in American law there
10 has been a trend toward a concept of biodiversity away
11 from single individual prescriptions for individual
12 species.

13 MR. MARTEL: But what I'm trying to drive
14 at is, would it come then? Would this continue to
15 occur on a broader field without legislation--

16 DR. THOMAS: Yes.

17 MR. MARTEL: --or would it be slow?

18 DR. THOMAS: It's coming anyway. I don't
19 think -- in most cases the passage of law runs ahead of
20 public opinion. It is required -- some stage setting
21 is required for law which may be merely recognition of
22 what already is.

23 However, sometimes laws are -- the
24 necessity for law is precluded by merely moving ahead
25 and making something happen without law, which I would

1 must prefer as an alternative. Laws have a tendency of
2 being very prescriptive rather than general guidance.

3 MR. MARTEL: But they stay in place, too.

4 DR. THOMAS: They do stay in place.

5 MR. MARTEL: And people are subjected to
6 them.

7 DR. THOMAS: That's correct. However, in
8 this particular case, at some point we are going to
9 have to come to the fact where we step back and
10 reconsider legislation and wrap it all into one package
11 because when you add one law on top of another it
12 impinges on the performance of the law before it.

13 We are in some trouble now for having too
14 many laws that tell us to do too many things on the
15 same piece of ground and I think ultimately we are
16 going to have to drop back and reconsider a more
17 inclusive piece of legislation.

18 MR. LINDGREN: Q. Aside from what
19 legislative requirements might be coming down the pipes
20 in the years to come, I would like to talk about
21 changes in management direction that's occurring within
22 the U.S. Forest Service.

23 In the excerpt I have just read you refer
24 to new perspectives. Are you familiar with the new
25 perspective approach being described by the U.S. Forest

1 Service?

2 DR. THOMAS: A. Yes.

3 Q. I take it --

4 MADAM CHAIR: Excuse me. Dr. Thomas, is
5 that the new forestry concept?

6 DR. THOMAS: It is related. The
7 difference is new forestry is a concept, new
8 perspectives is a formal program in the Forest Service
9 considering such things as new forestry.

10 MR. LINDGREN: Q. Under the heading of
11 New Forestry and new Perspectives, certain forestry
12 techniques or new techniques will be emphasized such as
13 leaving more snags, more live trees, down and dead
14 woody material and so forth.

15 Those are examples of the on-the-ground
16 prescriptions that we are likely to see if you are
17 serious about maintaining biological diversity. Do you
18 agree with that?

19 DR. THOMAS: A. I need to differentiate.
20 New perspectives as a program, nobody is quite sure
21 what -- we usually preface these statements about new
22 perspectives and new forestry with a caveat of whatever
23 that is.

24 Essentially new perspectives a licence to
25 think about new things, a licence to try new things, a

1 licence to be more innovative and more responsive to
2 new information. It's not a certain kind of thing. It
3 could be any mix of a number of things.

4 New forestry is largely associated with
5 Dr. Jerry Franklin, recently retired from the U.S.
6 Forest Service, professor at the University of
7 Washington, and his concepts of forestry which is that
8 we more mimic the natural situation.

9 For example, one of the concept he has is
10 we leave a considerable amount of more woody material
11 on site both for the provision of animal habitat,
12 protection of soil and retention, enhanced nutrient
13 cycling.

14 He also proposes leaving considerably
15 more standing trees and snags, standing dead wood.
16 That usually is a concept associated with one of his
17 visions.

18 Some of that is now being instituted and
19 tested as to whether it satisfies those hypotheses, but
20 none of this is very precise. It's more a matter of an
21 encouragement to consider new ways of doing things.

22 Q. Now, yesterday I provided you with a
23 copy of a two-page document entitled New Perspectives:
24 An Ecological Path for Managing Forests.

25 Do you have a copy of that?

1 A. Yes, I do.

2 MR. LINDGREN: Madam Chair, I have made
3 copies for the Board and the parties, but it is
4 actually an excerpt from Mr. Smith's source book,
5 Exhibit 1750, but I have reproduced it for ease of
6 reference. I don't believe it is necessary to mark it
7 as an independent exhibit. It already exists within
8 Exhibit 1750.

9 Q. Dr. Thomas, could I ask you to turn
10 to the second page of this brochure. In the middle
11 column under the heading A Thoughtful Program, in the
12 final paragraph we see a statement that:

13 "Alternative management techniques
14 developed by the program will be added to
15 the mix of traditional forestry
16 techniques. Some traditional harvesting
17 practices have tended to simplify the
18 forest structure in the next stand by not
19 leaving live trees, dead standing trees
20 and downed logs. This simplified forest
21 structure can result in the loss of
22 biological diversity."

23 Stopping right there. Do you agree with
24 that general assessment?

25 DR. THOMAS: A. Yes.

1 Q. Then the document goes on to read:
2 "Alternative techniques developed and
3 demonstrated in the program will result
4 in managed forests, but structural
5 complexity and biological diversity that
6 mimic natural stands."

7 You mentioned some of the alternative
8 techniques that might be considered. Would an
9 increased reliance on natural regeneration also form
10 part of that program?

11 A. Probably.

12 Q. What about modified cutting
13 techniques such as selective cutting?

14 A. Probably. I want to point out,
15 though, that these alternate techniques are just now in
16 the process of testing.

17 The statement in terms of the anticipated
18 advantages to do with such a system appear to be sound
19 in hypothesis applying common sense. Whether or not
20 they will -- how much or whether or not they will
21 induce or increase or retain biological diversity is
22 not demonstrated it appears logical.

23 Q. When Mr. Maser was here he was
24 indicating that the overall management direction is to
25 mimic or reproduce natural landscape patterns through

1 these alternative techniques.

2 Are you in general agreement with that
3 direction, that management direction; namely, the
4 mimicking of natural landscape patterns?

5 A. As a general theory that appears
6 appears to be rationale. Whether or not we would get
7 the results that we anticipate is another matter.

8 I have to admit I am one of the
9 scientists that is very cautious about the certainty
10 with which we project results associated with these
11 things. I am quite willing to say it appears likely.
12 I am perhaps not as certain as some others.

13 Q. Fair enough. Now, I think we agreed
14 a few moments ago that we need to undertake landscape
15 level management to ensure viable populations of all
16 wildlife species; is that correct?

17 A. That's correct.

18 Q. But within the context of overall
19 landscape management managers can undertake species
20 specific or featured species management?

21 A. That's also correct.

22 Q. And, in fact, that's what's done
23 routinely in U.S. national forests.

24 Can we agree that single species habitat
25 management or featured species management must not be

1 undertaken in a manner which compromises overall
2 landscape or biological diversity objectives?

3 A. Certainly in the U.S. that would be a
4 violation of our structure and law.

5 Q. But aside from being a legislative
6 contravention, wouldn't it make also good biological
7 sense not to contravene or conflict with overall
8 biodiversity goals?

9 A. We have a biodiversity goal
10 objective. We would set out to attain it. There is
11 room within that for emphasis of a number of different
12 things provided that one of the objectives and, as I
13 said, in the U.S. forest the underlying objective is
14 the retention of biological diversity. Once that's
15 achieved a number of other things can also be achieved.

16 Q. I would like to ask you a few
17 remaining questions on the use of HSA. I would like to
18 start by referring you back to the package of
19 interrogatories which has been marked as Exhibit 2099
20 and I would like to refer you to page 31, question No.
21 10(b) from Forests for Tomorrow. The question in 10(b)
22 asks you whether or not --

23 MR. MARTEL: What page?

24 MR. LINDGREN: Page 31.

25 Q. The question was:

1 "Would the use of HSA for moose, white-
2 tailed deer, pine marten and pileated
3 woodpecker be sufficient to ensure the
4 maintenance of biological diversity or
5 the maintenance of all wildlife species
6 in perpetuity within Ontario?"

7 And your answer is simply "no".

8 I am wonder if you could elaborate upon
9 that? Can you explain why that is the case?

10 A. Essentially I answered no because of
11 the fact I am not familiar enough with the Ontario
12 situation to know that that's inclusive. It would
13 appear to be me to be a good start.

14 Moose in early succession, white-tailed
15 deer requiring yards of stands in the winter time that
16 are older, pine marten related to older successional
17 states, pileated woodpeckers requiring large amounts of
18 woody material, both large size and reasonable amounts
19 both up and down.

20 That appears to be a good start, but
21 without a complete analysis in my own mind of what are
22 all the species involved and which ones of them would
23 be taken care of in these objectives I would have to
24 answer the question no.

25 Q. So I think what you are telling me is

1 that you haven't got the practical Ontario experience
2 to tell whether or not those are the most appropriate
3 species?

4 A. I don't know if they are the most --
5 there are people who are found of indicator species,
6 there are others who would go at it the other way
7 around and say these particular habitats produce these
8 species. It is looking up two different ends of the
9 tube.

10 I am more of a fan of the second
11 mechanism than of the first, even though I think the
12 first way will work as well. I just simply don't know
13 what the array of species is, the array of plant
14 communities nad whether or not that would be all
15 inclusive.

16 Q. Now, when you said you a fan of the
17 second and not the former I am not sure what you were
18 talking about?

19 A. The second mechanism is to be able to
20 look at particular habitat components or successional
21 states and individual habitat components and predict
22 from that what would occur there.

23 The other is to predicate the management
24 on particular species that prefer those kinds of
25 components and then assume that all others are taken

1 care of.

2 Either technique will work. They are not
3 grotesquely different. It's just conceptual
4 difference. I prefer the second.

5 Q. I think you have told me you haven't
6 done the analysis that would led you to select these
7 four species?

8 A. I have not done the analysis, but
9 those appear to me superficially as appropriate
10 species, but I just don't have the on-site information
11 to deal with it.

12 Q. When the Coalition terms and
13 conditions were filed some time ago and these were
14 identified as the species, I take it you had no input
15 into the selection of those species?

16 A. No.

17 Q. You didn't draft those terms and
18 conditions?

19 A. I did not.

20 Q. Okay. Do you have a copy of an
21 article that I provide to you yesterday entitled
22 Research on Wildlife in-Old Growth Forests: An Attempt
23 at Perspective?

24 A. Yes, I do.

25 Q. Did you write that document?

1 A. I did.

2 MR. LINDGREN: I would like to file that
3 as the next exhibit.

4 Madam Chair, I can indicate that this
5 document comes from the same publication, the one dated
6 May 1991 from the U.S. Forest Service.

7 MADAM CHAIR: This will becomes Exhibit
8 1208.

9 ---EXHIBIT NO. 2108: Document entitled Research on
10 Wildlife in-Old Growth Forests:
11 An Attempt at Perspective,
12 authored by Dr. Thomas, dated May
13 1991.

14 MR. LINDGREN: Q. Dr. Thomas, could I
15 ask you to turn to page 472. Can I ask you to look at
16 the left-hand column, last paragraph, and you write
17 that:

18 "Today's forest planning procedures rely
19 heavily on the use of linear mathematical
20 models that consider the effect of
21 several variables and their interactions
22 to predict the outcomes of various
23 biological processes - say timber
24 production or population sizes of a
25 wildlife species. The data that goes
into these models are seldom precise and
the interactions between the variables

1 considered are even less perfectly
2 understood. Such models were not
3 intended by their developers to provide
4 precise information. Rather, they were
5 intended to provide indications of
6 the direction of change, rough estimates
7 of the magnitude of expected change and
8 the time frame surrounding such change."

9 I have few questions based on that.

10 Yesterday Dr. Page referred to HSA as a tool, just an
11 aid to managers. Do you agree with that assessment?

12 DR. THOMAS: A. Yes.

13 Q. The numbers that are generated by HSA
14 are just numbers; they are not decisions, they are not
15 objectives, correct?

16 A. That's correct, they are information.

17 Q. And if HSA or some other planning
18 mechanism is to be used for a featured species or two,
19 the numbers and the results of the analysis must be
20 used and applied in a way that does not compromise
21 overall biodiversity or landscape goals?

22 A. I don't necessarily see if there are
23 an appropriate combination that there is a difference
24 between the two.

25 Q. I think you told me a few moments ago

1 that what you do first is ensure you have enough
2 habitat for everybody and once you have done that you
3 can start thinking about featuring species for a
4 particular reasons?

5 A. I also toll you that there were two
6 ways to do that and described those two different ways.
7 Either way you do it, if it is done correctly, it may
8 very well achieve that objective.

9 Q. At the of the top-right hand column
10 on page --

11 MADAM CHAIR: Excuse me. Before we move
12 on, those two ways were the ones you spoke about just a
13 minute ago?

14 DR. THOMAS: Yes.

15 MADAM CHAIR: Multi-indicator species.

16 DR. THOMAS: Yes.

17 MADAM CHAIR: Could you put a name on the
18 method that you prefer?

19 DR. THOMAS: I just call it habitat
20 assessment. The assumption being that you assess the
21 habitat to see what it would produce in terms of
22 biological diversity. That is determined by the number
23 of vertebrate species that are accounted for.

24 MR. LINDGREN: Q. Dr. Thomas, at the top
25 of the right-hand column on page 472, you indicate

1 that:

2 "The predictions coming out of these
3 models are too often taken to be more
4 precise than they really are."

5 And midway through that first paragraph
6 you indicate that:

7 "Such events make monitoring the results
8 of management applications (as required
9 by law and regulations and promised in
10 Forest Plans) so very critical. Only
11 adequate monitoring can enable the
12 necessary mid-course corrections in
13 management activities to be made if the
14 models have produced projections that are
15 out of line with reality - whether too
16 high or too low."

17 I take it when you talk about monitoring,
18 can we agree that monitoring is critical at all scales
19 from the local to the regional at the provincial scale?
20 We have to have a handle on all of those scales?

21 A. Yes.

22 Q. My final question to you is this, you
23 have referred briefly to the 10 per cent constraint
24 that has been proposed by the Coalition and I am
25 wondering if you could tell me, does the U.S. Forest

1 Service have an explicit 10 per cent constraint in its
2 legislation or regulations?

3 A. No. Some forests have adopted such a
4 target, an objective, others have not. It is not
5 precisely detailed.

6 Q. Okay. Mr. Patch, I have a couple of
7 questions for you. On Monday, Mr. O'Leary asked why
8 HSA is being used in New Brunswick and one of the
9 reasons you gave is that it is apparently a legislative
10 requirement in your view under the Crown Lands and
11 Forest Act.

12 Now, I have read the act and all the
13 amendments since 1980. Can we agree, nowhere does the
14 act specify that HSA technology or modelling has to be
15 used?

16 MR. PATCH: A. That's correct. What the
17 act says in an early section is that there is a
18 requirement to manage habitat for the maintenance of
19 fish and wildlife population.

20 Q. And that's all it says?

21 A. That's correct.

22 Q. Okay. Another question I had for you
23 had to do with one of the maps you put up on the wall
24 there and this was the one marked as Exhibit 2103C
25 which you identified as a working map.

1 You said that essentially identifies
2 harvest blocks and you said occasionally some ground
3 work or grounds truthing is done. I want to be clear
4 on this. Before operations actually commence do
5 pre-operation inspections get carried out?

6 A. Yes, each block is looked at with
7 respect to its characteristics before it's approved in
8 an operating plan.

9 Q. Is this done via a ground survey, a
10 fly-over? How is that done?

11 A. It's usually in the vast majority of
12 blocks done in a ground assessment, a field assessment
13 of each block.

14 Q. And who does that?

15 A. They are done by the Crown timber
16 licensees or the department.

17 Q. Okay.

18 A. I wanted to point out to that early
19 question that there is no specific legislative
20 requirement for habitat supply analysis, but it is
21 implicit when you say that you are going to have manage
22 habitat for the maintenance of wildlife populations.

23 You have got to look at how your forest
24 is going to change and make an assessment as to whether
25 you are meeting that goal in providing habitat supply.

1 Later on there are sections in the act
2 that require in the submission of the long-term forest
3 management plan that the company outlines its
4 activities with respect to managing fish and wildlife
5 habitat.

6 So you can look at those sections that
7 say that you are required to manage habitat for the
8 maintenance of populations, you are required in your
9 long-term planning to outline how you are going to do
10 that and to me that says you have to do a habitat
11 supply analysis, but there is no specific reference to
12 HSA.

13 Q. Okay. Dr. Page, I hope you are not
14 too disappointed but I no longer have a question for
15 you because Madam Chair put it to you this morning
16 about the role of the public in planning in B.C. You
17 provided an answer. I have no further questions.
18 Thank you very much panel.

19 MR. LINDGREN: Thank you, Madam Chair.
20 Those are our questions.

21 MADAM CHAIR: Thank you, Mr. Lindgren.

22 One question arising from Mr. Lindgren's
23 cross-examination and that was your answer, Dr. Thomas,
24 to landscape management.

25 DR. THOMAS: Yes.

1 MADAM CHAIR: Could you, please, repeat
2 your answer and let me understand whether -- did you
3 say that landscape management has come out of the new
4 perspectives new forestry approach?

5 DR. THOMAS: No.

6 MADAM CHAIR: All right.

7 DR. THOMAS: There are a number of
8 factors in natural resource management that have begun
9 to really come to the floor over the past 10 years.
10 They are different, but related.

11 Conservation biology which is the biology
12 associated with the management and preservation of rare
13 forms of life. The other is biodiversity
14 considerations that we maintain life forms and
15 processes and the other one is landscape ecology.

16 The one that you asked about was -- it is
17 a matter of scale. For example, when we initially
18 dealt with the spotted owl question we dealt with it
19 site specifically. Here is a patch of area of habitat
20 that would suit spotted owls.

21 As we went further, we soon recognized
22 that we couldn't it do on a site-specific basis we had
23 to have a certain number of these, they had to be a
24 certain distance apart, they have to have a certain
25 kind of habitat inbetween the nesting areas, the

1 nesting pair needed to be in proximity to one another,
2 and suddenly we were looking at a distribution on the
3 landscape that ran all the way from British Columbia to
4 California.

5 At that point the analysis was at a very
6 high -- if you visualize backing away from the earth,
7 we had to visualize it from a long way away. In other
8 words, we were considering it across three states
9 simultaneously. That required us to look at it in
10 landscape scale.

11 When you look at it in landscape scale,
12 we were suddenly beginning to cross various management
13 units that have been ironclad, isolated units for years
14 in terms of how we considered their manipulation.

15 Suddenly we are looking at management
16 across boundary lines between lands owned by -- or
17 managed by various federal agencies, suddenly we were
18 looking at the admixture of public and private land.
19 That's what I mean by landscape scale assessment.

20 MADAM CHAIR: All right. And would you
21 say that you practise landscape management with respect
22 to the spotted owl situation?

23 DR. THOMAS: Yes.

24 MADAM CHAIR: Would you say generally you
25 practise landscape management in national forests?

1 DR. THOMAS: Yes, but at a much lesser
2 scale than that. Essentially where we failed -- not
3 failed, but where we need to improve, over the last
4 segment we considered landscape up to the point that we
5 got to the forest boundaries and then he had an next
6 national forest down the line that did their own thing.
7 We didn't worry about how those management allocations
8 matched up on the forest boundary. Suddenly they
9 didn't fit when we began to talk about a larger scale
10 aspect.

11 In the next round of planning I'm sure
12 that those lines will not make nearly as much
13 difference as they did the first time.

14 MADAM CHAIR: Where does your view of
15 habitat supply analysis fit in as a tool with respect
16 to landscape management?

17 DR. THOMAS: Certainly if we deal with
18 the spotted owl issue, habitat supply analysis for that
19 entire species all the way from the British Columbia
20 line to California was a habitat supply analysis
21 problem and it was done at that scale.

22 I have done a number of others at much
23 smaller scale or help developed the technique for much
24 smaller scale analysis such as elk habitat analysis
25 which was done at the forest level, pileated

1 woodpeckers at the forest level.

2 MADAM CHAIR: Thank you, Dr. Thomas.

3 Thank you, Mr. Lindgren.

4 MR. LINDGREN: Thank you.

5 MADAM CHAIR: Mr. Cassidy?

6 MR. CASSIDY: Thank you, Madam Chair.

7 CROSS-EXAMINATION BY MR. CASSIDY:

8 Q. I want to start first by asking all
9 three of you just a clarification question. In Tab 3,
10 which is the tab of your panel's witness statement,
11 Exhibit 2097, that's the tab that talks about the
12 exhibits that you reviewed.

13 Mr. O'Leary provided us with an updated
14 version of the list of exhibits reviewed and I think
15 that there was also some transcript references that
16 were already found in Tab 3 that you all had an
17 opportunity to look at.

18 I am just wondering if any of you can
19 tell me if you had an opportunity to review the terms
20 and conditions -- draft terms and conditions filed by
21 the other parties other than the Ontario Federation of
22 Anglers & Hunters before you came here?

23 DR. THOMAS: A. I did not.

24 Q. Dr. Page?

25 DR. PAGE: A. I may have encountered a

1 few, but no, I did not review any in their entirety.

2 Q. Mr. Patch?

3 MR. PATCH: A. They were provided, but
4 we didn't have time to read everything that was
5 provided to us.

6 Q. So is it fair to say then with
7 respect to all three of you that you had an opportunity
8 to review and did review the Ontario Federation of
9 Anglers and Hunters' draft terms and conditions, but
10 have not had the opportunity or been able to review any
11 of the other terms and conditions filed the other
12 parties?

13 Is that fair to say with respect to all
14 three?

15 DR. THOMAS: A. That's true in my case,
16 yes.

17 DR. PAGE: A. I have reviewed some of
18 the terms and conditions of the Proponent.

19 MR. PATCH: A. Yes, I have reviewed the
20 terms and conditions of the Proponent as submitted in
21 1985 and amended in 1987.

22 DR. THOMAS: A. Just a minute until I
23 figure out what we are talking about here.

24 Q. Certainly.

25 A. We are separated by a common

1 language. I have a hard time knowing who the Proponent
2 is. I scanned that.

3 Q. You scanned the MNR's draft terms and
4 conditions?

5 A. Yes.

6 Q. But nobody else's?

7 A. Nobody else's.

8 Q. I want to, first of all, start with
9 you, Dr. Page. You were saying earlier and this
10 morning I heard you say - I think I have got it right -
11 that habitat supply analysis is a tool and there may be
12 other ways of achieving the maintenance of wildlife
13 habitat, but it is a tool that is used in that goal; is
14 that correct?

15 DR. PAGE: A. There may be other ways.

16 Q. Right. I also want to follow up with
17 you know with respect to Exhibit 2106.

18 If the Board has that in front of them,
19 that's the habitat assessment and planning tool series
20 of overheads that you filed, hard copy of the overheads
21 that you spoke to, Dr. Page. Do you have that?

22 A. Yes, I do.

23 Q. Now, you will recall that you talked
24 about the wood supply -- I'm sorry, the harvest rate
25 that is generated after various scenarios in this

1 collection of materials.

2 About 12 pages in or your 12th overhead I
3 guess in your presentation we see the start there of
4 some five-year cutting plans for scenario No. 1 and if
5 you flip over you see scenario No. 2 and scenario No.
6 3.

7 Am I correct that these in essence are
8 the outputs of your form of habitat supply analysis
9 that generated the figures in the lower right-hand
10 corner using those scenarios to generate the various
11 harvest rates?

12 A. The harvest rates in this particular
13 case was generated by some other timber planning
14 method. That plan was evaluated to determine the HSA
15 supply, yes, habitat supply.

16 Q. So once you turn the HSA on to the
17 wood supply analysis it spit out that figure of what
18 the harvest rate could be once you had applied HSA to;
19 is that fair to say?

20 A. No, the converse, that the timber
21 management plan in this particular case was determined
22 before HSA was applied.

23 Q. Yes.

24 A. Each of these three independently
25 were determined and then HSA was used to assess them.

1 That's not necessarily the ideal application, but that
2 is -- in this particular example that was the way it
3 was done.

4 Q. So HSA is applied to some form of
5 timber management supply analysis and at that end of
6 the day you end up with a figure of an allowable cut or
7 harvest rate per year that would be allowed to be done
8 after you have applied HSA? Is that roughly what's
9 happening here or could happen?

10 A. The two are intermixed in the sense
11 that you may have a certain harvest that results in a
12 certain habitat supply and only by looking at those
13 various options can you determine what the tradeoffs
14 are. The habitat supply does not determine the timber
15 harvest.

16 Q. But it may impact it? It might
17 reduce the level of harvest that could be done to
18 provide for the habitat supply you need?

19 A. It may. It could potentially even
20 increase it.

21 Q. Right. But what if it decreases it?
22 What I am curious about is, what if it is not
23 sufficient to meet the mill demands for that particular
24 area? What do you do in that circumstance?

25 A. In those cases the company will not

1 submit a proposal plan that they considered to be
2 economically insufficient. They would -- you know,
3 potentially they could.

4 Ordinarily they would submit an array of
5 options that they are comfortable with obviously a
6 preferred alternative, generally with a higher harvest
7 rate than the very lowest.

8 Q. What if the HSA is applied to the
9 wood supply that they feel they need and may be even
10 done at the same time so we are not having a constraint
11 mechanism, we are all working together, but it turns
12 out at the end of the day that what you are allowed to
13 cut is in fact too low for the mill, the mill needs
14 more to operate at an economic capacity, what do you in
15 that circumstance?

16 A. Then other mechanisms independent of
17 HSA kick in to resolve what could be a conflict.

18 Q. Such as?

19 A. Appeal to the chief forester, supply
20 of timber from another area. In other words, look at
21 adjacent areas to see if there is a general pattern.
22 Whatever options are available to these -- this is a
23 tool to a decision maker and there are other tools that
24 are available to him.

25 Q. So you have to go beyond HSA to try

1 and revolve that conflict if it were to arise?

2 A. You could. You don't necessarily
3 have to.

4 Q. Okay. I want to come to you, Mr.
5 Patch, about an exhibit that I quite frankly was having
6 trouble understanding and it is your Exhibit No. 2102.
7 This, again, is the hard copy version of your
8 overheads.

9 It is about the eighth page in. It is
10 the overhead that has Figure 3 at the bottom of it,
11 Softwood Volume Development Pattern in a Balsam Fir
12 Dominated Stand in New Brunswick.

13 MADAM CHAIR: Can you lift that up, Mr.
14 Cassidy?

15 MR. CASSIDY: (indicating). I believe it
16 is Exhibit 2102.

17 Q. Do you have it, Mr. Patch?

18 MR. PATCH: A. (indicating)

19 Q. Yes, there it is. Thank you.

20 MR. BERAM: I wonder Mr. Cassidy if you
21 could give us a hint too.

22 MR. CASSIDY: (indicating)

23 Q. Now, those arrows, as I understand
24 your evidence, Mr. Patch, that exist on this page of
25 Exhibit 2102, the eighth page, those arrows define, as

1 I recall your evidence, the areas of operability within
2 taht stand age; that is, the age -- the time frame
3 which is operable from an economic perspective to go in
4 and do something with that stand, take a management
5 action for that stand. Have I got that accurately
6 stated?

7 MR. PATCH: A. They represent an example
8 of what could be applied in a model of areas on a
9 curve, in this case a volume development curve, within
10 which a stand might be economically harvested.

11 In the FORMAN growth model and in the
12 yield curves there is a requirement to specify the
13 limits within which a stand could be available for
14 intervention such as harvesting.

15 Q. So it's between those two arrows
16 which would be roughly in this example between the age
17 of 50 and 100, for this particular example, that it is
18 economically operable or feasible to go in there and
19 take some timber management action in that stand?

20 A. This would probably represent within
21 the area within the life of the stand where it would be
22 economically feasible to clearcut as an action.

23 Q. Okay.

24 A. The first arrow at 50 years of age is
25 at a relatively high volume, but indicating that before

1 the stand is 50 years of age there are a lot more stems
2 per unit volume because stands get dense and they grow
3 and when the stands get bigger they fall out.

4 So in economic terms, in terms of current
5 harvesting methods, and that could change, as applied
6 in New Brunswick stands younger than around 50 years of
7 age have too many stems per unit volume referred to as
8 piece size.

9 Q. Yes.

10 A. Therefore, you cannot harvest. At
11 the outer end --

12 Q. You can't harvest in an economically
13 feasible way; is that right?

14 A. On a conventional method.

15 Q. Right.

16 - MADAM CHAIR: Excuse me, Mr. Patch. Are
17 you talking about thinning or are you talking about --

18 MR. PATCH: I am talking about
19 clearcutting.

20 MADAM CHAIR: Which species do you
21 clearcut in New Brunswick that would be in the 50 year
22 age class?

23 MR. PATCH: We could cut spruce and fir
24 stands and mixedwood stands with a proportion of spruce
25 and fir.

1 Our timber supply analyses and our curves
2 relate to the softwood volume within a stand and they
3 key species are spruce species, jack pine and balsam
4 fir.

5 MADAM CHAIR: What is the diameter of
6 that at 50 years?

7 MR. PATCH: I don't have the exact curve
8 in front of me, but at 50 years it would be a minimum
9 operable diameter which would not be a large diameter.

10 MADAM CHAIR: All right, thank you.

11 MR. PATCH: That would be right at the
12 level where you are just turning from the constraint
13 from being economically harvestable until a size that
14 is operable.

15 MADAM CHAIR: Thank you.

16 MR. CASSIDY: Q. Well, in my layman's
17 understanding of this that graph tends to tell me that
18 anything less than 50 years of age in that particular
19 stand it is not economically feasible for me as a
20 company, for example, to go in there and do some timber
21 management activity.

22 It just isn't economically feasible at
23 anything less than 50 years of age and anything over
24 100; have I got that right?

25 MR. PATCH: A. No, in that that's

1 defining the limits within it's economical to clearcut,
2 to harvest.

3 Now, in forest management it is, in the
4 broader spectrum, at much younger ages quite practical
5 to go in and thin stands and space them and do other
6 forest management related treatments that don't relate
7 to harvesting and getting forest products, but relate
8 to speeding up the development of the stands and
9 changing stand composition so it will grow the species
10 you want to see, and because you space them out they
11 will be operable at an earlier age at some time in the
12 future.

13 Q. Who pays for that situation, Mr.
14 Patch, where you want to take those actions but it is
15 not economically feasible to do so from a harvesting
16 perspective?

17 A. Well, I wouldn't use the term
18 economically feasible in relation to harvesting and
19 relate that to the economic justification for
20 silviculture, but in terms of silviculture actions that
21 are taken in terms of spacing or planting obviously at
22 a much earlier age right after harvest the companies
23 are required to space and plant at specified levels
24 based on an understanding of forest growth and returns
25 and how much allowable cut they can get. We call that

1 basic silviculture. The companies are reimbursed by
2 government for undertaking basic silviculture.

3 Q. All right. And that could cover any
4 activity which takes place before you fall within those
5 arrows?

6 A. In terms of...

7 Q. Reimbursement.

8 A. ...reimbursement eligibility, yes.
9 The companies can also do silviculture on their own
10 above and beyond forest management agreement levels at
11 their own cost.

12 Q. Right. Now, you said in your
13 evidence on Monday, Mr. Patch, that even aged
14 management is practised on most of the landscape in New
15 Brunswick. Does even aged management involve
16 clearcutting as a harvest technique?

17 A. Yes.

18 Q. Is that, in fact, the dominant form
19 of harvest technique in New Brunswick?

20 A. Very much so.

21 Q. I want to continue on with you, Mr.
22 Patch. I don't mean to pick on you, but I find this
23 interesting. I want to move to Exhibit 2105 now.

24 A. Yes.

25 Q. That's your Progress Report on the

1 forest land habitat management program dated October
2 1991.

3 MADAM CHAIR: Excuse me. Which exhibit
4 was that, Mr. Cassidy?

5 MR. CASSIDY: Exhibit 2105.

6 MR. CASSIDY: Q. If we can go to the
7 executive summary, which is the very first page of
8 Exhibit 2105, in the fourth paragraph there it says:

9 "The inclusion of wildlife habitat goals
10 in forest management planning is a new
11 process."

12 Then if you move up to the paragraph
13 above, it states that:

14 "Beginning with plans submitted in 1992
15 management objectives for Crown land
16 will include specified quantities."

17 Is it fair to say in light of those
18 paragraphs and in light of what you have said in your
19 evidence that the use of habitat supply analysis, that
20 approach, is a relatively new phenomena in New
21 Brunswick?

22 MR. PATCH: A. The difference is in the
23 early 1980s we were looking at projections of forest
24 growth and looking at the available forest and
25 different types and, in effect, that was a habitat

1 supply analysis.

2 So we were trying to analyse what our
3 future forest structure would like like with the
4 available models and information we had at the time.

5 The difference now, and this would give a
6 better answer to the earlier matter that came up, is
7 that we have specified a requirement in the submission
8 of forest management plans that says that industry in
9 submission of their plans are required to do a habitat
10 supply analysis.

11 So that we have set a goal for each Crown
12 timber licence for, as it says here, specified
13 quantities to mature coniferous forest types. In the
14 past we did not specify goals.

15 Q. I understand that. I am just trying
16 to get a handle on the time frame. That's a relatively
17 recent development in new Brunswick; i.e., you didn't
18 do that 10 years ago; is that right?

19 A. No. Ten years ago the companies were
20 required or we did forest growth modelling as part of
21 the forest management process, but analysed it to see
22 the outcome in terms of the potential allowable cut and
23 the associated silviculture levels that were required
24 to maintain that cutting level.

25 Q. So the HSA approach has only been

1 used in New Brunswick -- has only been started in New
2 Brunswick within the last 10 years?

3 A. That's correct.

4 Q. You would not consider that to be
5 long term in the life of a forest, would you, 10 years?

6 A. No.

7 Q. In light of that, then, it is also
8 fair to say that you do not have any long-term
9 experience with the use of the HSA approach. It's just
10 brand new, isn't it?

11 A. Our experience with the approach for
12 forest growth modelling had started in the 1970s and
13 the forest growth modelling process is, in effect, a
14 habitat supply modelling process in that you are
15 predicting what your future forest will look like.

16 So the experience in predicting forest
17 growth and changes is equivalent to the experience with
18 modelling forests for timber objectives.

19 Q. So you have been doing the HSA
20 approach since the 70s?

21 A. Yes. We didn't call it, but we were
22 forecasting what our forests were going to look like.

23 Q. I see. But that's quantitatively
24 different than using the HSA approach I thought?

25 A. The HSA approach is using the output

1 of the forest growth modelling and relating that to
2 what the impacts may be on particular wildlife species
3 depending on your understanding of the forest types
4 they need.

5 Q. So we are now back to the 70s. In
6 the 70s you started doing this in some fashion?

7 A. Yes.

8 Q. Is that the long term in the life of
9 a forest, 20 years? I think we can probably agree it's
10 not.

11 A. I think we agree or one would agree
12 that forest management is a long-term process and that
13 we are trying to manage and project forests over an
14 80-year time horizon.

15 Q. Right. Let's go to page 48, Mr.
16 Patch - and I will tell you why I am asking about your
17 experiences - of your witness statement. That's
18 Exhibit 2097.

19 You stated that one of the advantages of
20 the HSA approach, and this is in answer to question No.
21 94, that one of the advantages of that is it would be
22 to reduce - and I am looking at the very first one
23 there, little one - reducing conflict among forest
24 managers and between the public and professional forest
25 managers in the long term.

1 I suggest that even if you go back 20
2 years you don't have any long-term experience with the
3 use of the HSA approach that would allow you to make
4 that statement and that, in fact, that's your hope for
5 the future; is that correct?

6 A. I see that there has been a change in
7 public attitudes that have shown that the public are
8 not satisfied with how their forests are being managed,
9 and I see a credibility problem and that's been
10 reflected in surveys of people's attitudes.

11 I have seen a problem with people saying:
12 Well, what are your objectives, and in terms of forest
13 managers and biologists and looking at habitat supply
14 the forest industry has been saying: Why are you
15 imposing these constraints, what are you getting out of
16 them, what is the quantitative tradeoff as a result of
17 doing this type of activity on wood supply because you
18 want to provide "x" amount of habitat and tell me why
19 you want to produce "x" amount of habitat.

20 To me, that when you force these things
21 to be explicit, when you demonstrate to the forest
22 industry this is why I'm doing that, it is not for some
23 nebulous reason, I'm doing it because it is good and it
24 is not because I feel that as a result I might or could
25 supply a particular habitat objective. It is because

1 by employing this process I can made these tradeoffs
2 specific.

3 In terms of the public credibility. If
4 - one can turn to the public and say: Yes, we are
5 looking at the long-term impact in terms of what our
6 future forests will look like and whether we are
7 supplying habitat for future species and certain
8 population levels.

9 So I see, and this is obviously a
10 judgment, that if we are going to apply a habitat
11 supply analysis approach that in the long term it
12 should reduce conflict and increase public confidence.

13 Q. It should, but you have no long-term
14 experience which would enable you to state that
15 position to the Board; is that correct?

16 A. Well --

17 Q. It just started.

18 A. I think that things are getting
19 better already in terms of the New Brunswick
20 experience.

21 We have in the particular region that I
22 am in a leader in providing public information in terms
23 of Miramichi Pulp and Paper. They have come out and
24 publicly taken people on tours and described their
25 forest management activities for timber.

1 Q. Sir, I am talking about habitat
2 supply analysis. There are companies in Ontario that
3 do that all the time. Let's stick to habitat supply
4 analysis as part of a conflict resolution mechanism.

5 A. Part of their package and the
6 information that they are providing to the public is
7 saying: Look, we are doing and looking after habitat
8 supply in our forest management planning.

9 So it's not just the outside. There is
10 also the inside and the information that's provided to
11 them.

12 DR. PAGE: A. I have testified to a
13 identical benefit of HSA and I came to that conclusion
14 based on two sources of information.

15 First, our own experience which I
16 testified to earlier, that deer and elk winter ranges
17 are really not a major item of conflict any longer and,
18 secondarily, having worked with the U.S. Forest Service
19 staff for over 10 years now that have been using HSA
20 for a relatively long period of time it has managed
21 substantially to reduce conflict particularly between
22 the managers.

23 The public's expectations tend to be
24 changing in different methods, but the HSA and the use
25 of the HSA has undoubtedly reduced conflict as

1 testified here.

2 Q. It will never eliminate conflict
3 though, will it, Mr. Patch?

4 MR. PATCH: A. No, but it changes the
5 focus of the conflict and that's a real important
6 point.

7 The conflict then becomes deciding about
8 what objectives we want from the public land and that
9 will always remain, but now you have a tool to quantify
10 what is the impact of, say, maintaining this objective
11 or maintaining another objective and then making a
12 conscience tradeoff.

13 But I expect there will always be
14 people -- and Dr. Thomas made reference earlier to
15 conflict resolution in a way in talking with questions
16 by Mr. Martel, that there always will be conflicts.
17 There will always be people who have certain
18 expectations and may not be satisfied that their
19 expectations are met because they have a particular
20 focused interest and maybe aren't as sensitive to the
21 other interests and demand.

22 Q. For example, native concerns could
23 not possibly be met by habitat supply analysis, could
24 they?

25 A. It would depend on the nature of what

1 you mean by a native concern. There are native people
2 who are concerned about: Are we managing our forests
3 for wildlife.

4 Q. Traditional use of land as the
5 natives would like to see it used in their traditional
6 way, you can't factor that into habitat supply
7 analysis, can you?

8 A. The tool is a tool to look at the
9 impact of harvest scheduling. So where you are going
10 to cut your forest across the landscape and over time
11 and assessing the impact on wildlife species. That
12 doesn't resolve social allocation issues.

13 Q. Right.

14 MADAM CHAIR: Excuse me, Mr. Cassidy, I
15 think we will take your afternoon break now if it is
16 convenient.

17 MR. CASSIDY: I only have about 20 more
18 minutes, Madam Chair, so I can finish easily before the
19 day is out.

20 MADAM CHAIR: Okay. Mr. Freidin, you
21 will be starting today.

22 MR. MARTEL: Finishing.

23 MADAM CHAIR: Just one question for Mr.
24 Patch and Dr. Page as well, is it the case in both New
25 Brunswick and British Columbia that there is no formal

1 requirement for public participation in your timber
2 management planning processes?

3 MR. PATCH: In New Brunswick there is no
4 formal consultative process as required by law.

5 MADAM CHAIR: Dr. Page?

6 DR. PAGE: There is no legal requirement,
7 but the ministry has set an objective to encourage and
8 include public participation.

9 MADAM CHAIR: Thank you.

10 MR. O'LEARY: Madam Chair, before you
11 recess I just wanted to bring one point to your
12 attention and that is, I spoke with Mr. Freidin just
13 before we commenced this afternoon and indicated that
14 Dr. Thomas has a flight and will probably be
15 accompanying Mr. Martel to the airport tomorrow, but he
16 has other commitments that he has to leave tomorrow
17 around four.

18 DR. THOMAS: My flight is at five.

19 MR. O'LEARY: Your flight is at five.

20 MR. MARTEL: You will be on the plane, I
21 can assure you.

22 DR. THOMAS: I like that.

23 MADAM CHAIR: We will be back in 20
24 minutes.

25 ---Recess at 2:40 p.m.

1 ---On resuming at 3:00 p.m.

2 MADAM CHAIR: Please be seated.

3 Mr. Cassidy?

4 MR. CASSIDY: Thank you, Madam Chair.

5 Q. I want to come back to this point,
6 Mr. Patch, and I don't want to accuse you straight out
7 of overselling the value of this great approach of
8 habitat supply analysis, and I want to assure you that
9 I am not counsel for the tourist outfitters since they
10 are a member of the Coalition here, but I am curious as
11 to how -- this goes back to what Mr. Martel was saying
12 in Volume 346 of the transcript and Madam Chair.

13 It seems to me you are trying to suggest
14 you can adaptively manage away all the world's problems
15 and I am just curious about how the HSA approach could
16 ever reduce a conflict between a company and a tourist
17 outfitter over a buffer zone width or access to a
18 remote lake. We hear an awful lot of those conflicts.

19 MR. PATCH: A. Well, one wouldn't
20 pretend to assume that with different tools you are
21 going to solve all the world's problems. Dr. Thomas
22 refers to when you have a particular problem sending
23 a -- having a SWAT approach, solve with available
24 technology.

25 In terms of conflict resolution, no

1 planning tool that looks at your management actions and
2 the outcome of your management actions will eliminate
3 conflict.

4 However, once you have a certain decision
5 space, as Dr. Thomas has referred to, and put the
6 bounds for which what will be the outcome of managing
7 for a wildlife output versus a timber output, then the
8 people who are required to make a decision can make
9 that on a more informed basis.

10 With respect to forest cutting and
11 resolving tourist outfitter conflicts, this tool
12 doesn't address that.

13 As I said, the tool is one that
14 specifically addresses looking at your forest in terms
15 of its structure today, looking how that is going to
16 change given how you are going to cut it in space and
17 time and this is in the principle to any tool of
18 habitat supply natural SIS, and in looking at the
19 impact of applying those management actions at some
20 point in the future in the types of forest stands and
21 it is very sophisticated in exactly where they are
22 going to be and what they are going to provide.

23 Q. I think Dr. Thomas was talking about
24 a situation earlier where all of a sudden aesthetic
25 concerns come in and I won't say out of left field, but

1 into the scenario and they have to in the United States
2 readjust their management plans to take that into
3 account.

4 Is it fair to say that the conflicts that
5 you have been focusing on - and I might even say you as
6 a whole panel - has really been the conflicts between
7 the biologist and the forester as to how you deal with
8 the forest structure to achieve the objectives that
9 each of you want, but there is a really other big
10 factor out there being the public which may have
11 concerns that are not really related to forest
12 structure in the sense in which biologists and
13 foresters have dealt with them from their objective
14 point of view?

15 DR. THOMAS: A. I would certainly say in
16 the United States that's true. The wilderness advocate
17 who wants the southfork of whatever named river placed
18 into wilderness really doesn't care about forest
19 structure one way or the other. It is a different
20 question.

21 I want to make it very clear that being
22 able to do a habitat analysis does not solve all
23 problems. It's just one aspect of the problem which is
24 the production of wildlife for managed forests.

25 It doesn't solve hydrology problems, even

1 though I think appropriate models can be done to do
2 that along with others, but as Mr. Martel asked: Well,
3 what about looking ugly. Well, we can handle that as
4 well in the prime we are doing in the United States,
5 but it still will not make a decision that makes
6 everybody happy.

7 Q. You have to use other management
8 tools or approaches beyond habitat supply analysis to
9 deal with some of those other problems?

10 A. Yes, sir.

11 Q. What about aquatic resources, Mr.
12 Patch? How does habitat supply analysis deal with
13 conflicts over aquatic resources?

14 MR. PATCH: A. The approach that we have
15 doesn't deal with conflicts with respect to aquatic
16 resources except in the sense that part of the
17 requirements in most jurisdictions involve a
18 requirement to have watercourse buffer strips which as
19 part of their rationale is to protect the fish habitat.

20 Now, in terms of the impact or the
21 contribution to habitat supply of those areas within
22 watercourse buffer strips you can assess what they are
23 contributing with respect to wildlife habitat. You can
24 also look at what the impact is on wood supply as a
25 result of having areas as watercourse buffer strips

1 that are excluded from being available for timber
2 harvest.

3 I would think -- it's not just HSA. It's
4 forest growth modelling of which HSA is just a part.
5 You can look at conflicts that relate to people having
6 different objectives. I am by no means an expert on
7 tourist outfitting because we don't have the remote
8 tourist outfitting in the same context, but if you were
9 going to say that people wanted no disturbance in terms
10 of timber harvest around or within a particular
11 distance of a tourist outfit establishment, then you
12 could say: Okay, that area is going to be allocated
13 towards that purpose.

14 What is the impact of allocating that
15 area for that purpose on wood supply and how will the
16 habitat change in there in the absence of active
17 intervention through timber harvesting.

18 So one can use these forest growth
19 modelling tools to look at impacts of setting areas
20 aside so that they are not included in availability for
21 timber harvest or there might be some other methods or
22 special techniques that might be applied and assess
23 that in terms of habitat and in terms of how much wood
24 supply could be supported from a given land base given
25 the forest that's on it.

1 DR. THOMAS: A. I would comment that I
2 don't pretend to be an aquatic biologist, but we are
3 moving forward now in the U.S. with that application of
4 the same kind of technology in the fisheries because
5 we have a very large anadromous fish question; the
6 salmon and the steelhead that spawn in fresh water and
7 move to the ocean. That's our next big issue and we
8 are beginning to apply this technology to looking at
9 it.

10 Q. Would it be able to predict long-term
11 fish habitat requirements?

12 A. Yes. At least they will attempt do
13 that that.

14 DR. PAGE: A. We are going under the
15 same program in British Columbia identical and that
16 program is actually larger in scope than the wildlife
17 habitat supply analysis.

18 It provides another one of the tools in
19 the worker's tool box, in this case the forest
20 managers, and I think the issue of which tool to use is
21 an important one, but it's clear that although the
22 hammer is a valuable tool it would be more appropriate
23 to use a screwdriver if that's what you are trying to
24 achieve. The tool does not meet all possible
25 objectives.

1 MR. PATCH: A. In terms of these tools
2 that are available, like the forest growth models that
3 are involved in habitat supply analysis, as I said
4 earlier, they are the same type of tools that we base
5 decisions on timber supply on and they are relatively
6 new also, but where it is determined that they are the
7 best tools available to look at what the forest is
8 going to look like given a cutting rate those are the
9 tools employed.

10 The WASFOR model that we used in the
11 early 1970s got converted to the FORMAN model in the
12 mid 1980s. We will be using something else that will
13 be a new model at some point in the future, I'm sure,
14 as we refine our methods and become more efficient.

15 Q. Maybe I can follow up on that because
16 I am curious how this HSA approach got on board in New
17 Brunswick.

18 First of all, as I understand it, there
19 have been no plans yet that have actually been approved
20 and implemented in New Brunswick that have used the HSA
21 approach. They are about to be, but no plan is
22 actually in place yet using HSA; is that correct?

23 MR. PATCH: A. That's correct in that
24 that the application of doing a habitat supply analysis
25 is a requirement of timber companies in submitting

1 their 1992 management plans. They are in the process
2 of developing those plans.

3 Q. But none have yet been submitted?

4 A. No.

5 Q. They are working on it?

6 A. That's correct.

7 Q. So we have no experience that you
8 come here and tell us what has happened with the plan
9 so far?

10 A. Well, we have some preliminary
11 experiences that are quite encouraging with respect
12 to -- again, in the region where I work we are in
13 discussion with the foresters involved in putting
14 together the plan and how they are making out with the
15 wildlife aspects of the forest growth model.

16 In the past, as I have said quite a bit
17 earlier, we have recognized that there are other
18 demands on the forest which means that the total area
19 will not be available exclusively for timber harvest,
20 and that in 1982 we rather arbitrarily applied a 15 per
21 cent reduction on our area available which resulted in
22 15 per cent in allowable cut to take into account the
23 assumed area that would not be available as a result of
24 site specific habitats, as a result of inoperable areas
25 or other factors that would make it a total forest not

1 available exclusively to maximize or to be available
2 for timber production solely.

3 There are some preliminary results which
4 indicate that as a result of the mature coniferous
5 forest habitat objective and as a result of the deer
6 wintering area management unit approach to assessing
7 and tracking deer habitat, that in the Crown timber
8 licence in my area it is resulting in about a 10 per
9 cent reduction in AOC that is attributable to having to
10 manage for those habitat objectives.

11 Further, they are finding in the
12 preliminary analyses that that reduction can be
13 compensated with additional silviculture in terms of
14 spacing, increasing spacing areas to speed up the
15 development of stands that can compensate for the other
16 objective of managing for a certain proportion of
17 mature coniferous forest habitat.

18 That is not to say that the price, if you
19 will, of having a habitat objective is necessarily not
20 so great, it may be more or less in different areas,
21 and these figures might well change in the next few
22 months.

23 The point is that for the first time it
24 is explicit and we are saying: You are going to manage
25 for so many hectares of mature coniferous forest

1 habitat. We are setting that objective because we have
2 a concern about the supply of that kind of habitat and
3 the whole spectrum of species that depend on that.

4 Now we can make a tradeoff between what
5 does it cost an allowable cut for meeting that
6 objective. Now, maybe that tradeoff will be determined
7 to be too high. If it is too high, then we are going
8 to have accept a reduction in the mature coniferous
9 forest habitat objective if it is going to interfere
10 with the economic viability, but make a conscience
11 tradeoff.

12 I see that quite promising. So we are
13 having an encouraging experience which I think is much
14 more encouraging or we have more knowledge than we
15 would have if we didn't have this type of tool.

16 Q. Well, it is one thing to judge a
17 program's success by simply the fact that you have
18 expressed something explicitly, but I think you would
19 agree with me, would you not, that it would be better
20 to have actual experience with what the program has
21 produced than to simply state that it is a success
22 because it has now quantified objectives?

23 DR. THOMAS: A. May I speak to that?

24 Q. Sure.

25 A. We took on just the attitude that you

1 are expressing here--

2 Q. I don't claim to be original, Dr.
3 Thomas.

4 A. --by refusing to address it the best
5 way we possibly could. Eight years ago we were
6 projecting a timber yield of the U.S. forest at 30
7 billion board feet, we are down under 10 now and a
8 large part of that we walked right into.

9 Q. I am curious, Dr. Thomas, as to how
10 you actually measure the success of habitat supply
11 analysis. This is the thrust of my questions.

12 You were talking earlier this morning and
13 you cautioned us at length against using population
14 numbers as a measure of the success. What do you
15 measure habitat supply analysis, the success or failure
16 of, if not through population?

17 A. I have answered that about six times.
18 I will be happy to repeat it. You can do--

19 Q. I would appreciate it.

20 A. --population output.

21 Q. Go ahead.

22 A. You can to trends, you can do success
23 rate, you can do presence or absence, you can use a
24 number of levels of those things.

25 Very obviously if your deer numbers drop

1 below an acceptable level to support hunting you will
2 know that something is wrong. Biologists are good
3 enough to determine, I believe, what is wrong. It
4 could be you are hunting too heavily, we are going to
5 reduce hunting, it could be we have a predator problem,
6 it could be we have a sex ratio problem, but basically
7 underneath that is the habitat. I don't think we are
8 have far away from being able to produce quick results
9 in terms of how we analyse habitat.

10 Otherwise we merely go and say: Golly,
11 something is going wrong here. Wow, I wonder what it
12 is. We don't do that. We go out and determine what we
13 think it is and we try to respond to it.

14 The other aspect of it, it is no more --
15 we have really not that much more experience in being
16 able to deal with timber outputs. Relative to the
17 length of a forest in the Pacific Northwest, as you
18 asked the question, our experience with timber outputs
19 is very, very brief. In many cases we are just now
20 entering our second rotations.

21 There are some big difference between, in
22 some cases, the second and the first and we are
23 correcting back, but we are still going to proceed on
24 the basis of excellent knowledge and our ability to
25 forecast even if we had been wrong in the past. The

1 journey starts with the first step.

2 Q. Thank you. Now, Mr. Patch, I want to
3 come back to the development of this in New Brunswick.
4 On page 37 of your witness statement you indicated in
5 answer to question 69 -- I will just read it quickly.
6 It is just lines.

7 "The Crown Lands and Forest Act of 1982
8 required that Crown lands be managed to
9 maintain wildlife habitat."

10 Then you say:

11 "Our problem was how do to it."

12 Would the "our" there be meaning the
13 Department of Natural Resources and Energy in New
14 Brunswick?

15 MR. PATCH: A. Well, if we look at the
16 legislation, and we talked a bit about that earlier,
17 there is a stated requirement to manage habitat for the
18 maintenance of wildlife populations.

19 Q. Right.

20 A. That is the minister, meaning the
21 Crown had to set up a procedure in order to meet that
22 requirement.

23 Q. Is that why you were part of the team
24 that helped develop this, a group of experts who were
25 charged with the responsibility of figuring out how to

1 do it?

2 A. Just prior to enactment in 1980
3 through 1982 I was working with the forest management
4 branch as it was called in timber management and my job
5 was to be involved in the new forest inventory that we
6 were designing and to be involved in forecasting forest
7 growth and allowable cut and silviculture rates and
8 this was done on each of the 10 Crown timber licences.
9 That was a period in which I was working with Gordon
10 Baskerville on this.

11 During that period, and this is
12 independent of the legislation, I had suggested that if
13 we are going to look at what our future forest looks
14 like and we have a legislative requirement in place to
15 manage wildlife populations, then the logical thing
16 would be to look at what the future forests look like
17 and to do some assessment as to whether we are going to
18 provide enough habitat to maintain wildlife populations
19 as a result of how we were changing our cutting in the
20 forest.

21 So in 1982 I was transferred from the
22 timber management branch to the fish and wildlife
23 branch and given the mandate to try and develop a
24 system of integrating forestry and wildlife management
25 or timber and wildlife management; in other words,

1 develop a habitat supply analysis procedure.

2 Q. Dr. Page told us earlier that habitat
3 supply analysis is a tool to achieve the management
4 of -- the maintaining of wildlife habitat and he said
5 there were other ways do it.

6 Given that, why is it in your view
7 implicit that HSA would be used in New Brunswick when
8 it is not even mentioned in the legislation?

9 A. I think what Dr. Page was referring
10 to, and he can correct me, is that there are other
11 particular techniques of habitat supply analysis that
12 can be employed, and in my view if you are going to
13 manage wildlife habitat for the maintenance of wildlife
14 populations, then you are going to look at your actions
15 on that habitat and see whether through time as a
16 result of your actions that you are providing the
17 habitat to support those population. That to me means
18 that you do a habitat supply analysis.

19 As I indicated before, there was that
20 section of the act that says you have to manage habitat
21 for the maintenance of fish and wildlife populations.
22 There is a section in the act that says that the Crown
23 timber licensees, those who were developing the
24 management plans, are to enter into forest management
25 agreements with the minister.

1 A forest management agreement will set
2 out the responsibilities of the minister and the
3 licensee for the management and use of Crown land and
4 shall require the submission of a management plan, and
5 then further on the legislation in terms of management
6 plan responsibilities says that the management plan for
7 a 25-year period - so that's the blocking into the
8 future - the management plan will describe the
9 objectives and describe the manner in which the
10 licensee will manage Crown lands under his licence with
11 respect to fish and wildlife habitat.

12 Q. Do you agree with me that that
13 doesn't refer to habitat supply analysis or even
14 requires you to use it and, in fact, it leaves it up to
15 the experts to decide the best tool to achieve those
16 objectives? Do you agree that that's the case in New
17 Brunswick and that's exactly what you did?

18 A. You will have to start that, please,
19 over for me.

20 Q. Well, you read this statute to the
21 Board and I am suggesting to you that it nowhere tells
22 anybody to use habitat supply analysis. It simply left
23 it up to the experts to devise the way to maintain fish
24 and wildlife habitat. That's what the legislative
25 scheme in New Brunswick works like and that is in fact

1 what you did. You had experts which went away and came
2 up with habitat supply analysis as the way to do that?

3 A. Yes. We are given the mandate to set
4 out a procedure for management of Crown lands so that
5 we manage for the maintenance of habitat for wildlife
6 populations.

7 Q. And the way in which you did that was
8 to come up with HSA as a tool?

9 A. Yes. To us some form of HSA is the
10 only logical alternative to be able to look at forest
11 management and predict or meet the objective of
12 maintaining habitat for any wildlife species.

13 DR. THOMAS: A. I would like --

14 Q. I'm sure that in 19 -- just hear me
15 out. I am sure that in 1970 OWOSFOP was considered to
16 be the only tool for wood supply modelling and then in
17 the 1980s, as you have indicated, Mr. Patch, FORMAN
18 comes along.

19 What confidence can you give this Board
20 that HSA is not going to become the eight track of the
21 21st century?

22 MR. PATCH: A. The thing is that HSA, as
23 we have talked about, is a concept, as is forest growth
24 modelling. When we moved from, say, OWOSFOP as a tool
25 to forecast how the forest is going to change we got a

1 better model, FORMAN, and we employed that. .

2 I don't think the underlying ecological
3 reality that we are dealing with forests and stand
4 types that grow and develop and change over time that
5 will react to cutting and intervention means that we
6 will always need some means to forecast what our stands
7 look like and how they will change. The models will
8 change.

9 The same thing with habitat supply
10 analysis. I would not be an advocate and say that the
11 particular methodology of habitat supply analysis that
12 we are using in New Brunswick is the one that should be
13 employed in Ontario or elsewhere, but what I am saying
14 is that in order to truly manage forests to meet an
15 output or production objective for wildlife habitat,
16 and given the fact that over time you are going to be
17 doing interventions and cutting in those forests, you
18 have to have some habitat supply analysis type of
19 approach.

20 The specific approach or methodology or
21 tools or models or GIS will certainly change over time,
22 but the requirement to have predictive capability about
23 what the effects of your action will be on timber
24 supply and on wildlife habitat supply, I don't see that
25 underlying requirement changing.

1 Dr. Thomas?

2 DR. THOMAS: A. My only comment was to
3 be exactly the same. Habitat supply analysis is a
4 concept. There may be a number of ways to do it.

5 The way it has been done in the three of
6 our experiences and is being done across the United
7 States, if it is not done in a way in a managed forest
8 where you can quickly compute what the tradeoffs are it
9 is a relatively useless tool because the line officer
10 will always ask you: What will be the effect of that
11 decision on timber production.

12 There may be another way in terms of the
13 systematics to do that, but I and none of the
14 -colleagues that I work with in this information and
15 trying to deal with wildlife and forestry or wood as a
16 joint product can come to any other conclusion, but
17 they have got to be based somehow in the same data
18 bases so the information that comes out can be
19 comparable.

20 I wouldn't argue five minutes about the
21 number crunching techniques that do that, but the basic
22 underlying data is going to be forests, their progress
23 through time, how they are arranged in time and space
24 and what the treatments are.

25 DR. PAGE: A. I think it is more than

1 coincidence that when agencies across North American
2 have been having to address that particular question
3 that they end up coming up with a method that's
4 relatively similar.

5 The HSA structure that we have identified
6 before the Board here is successful we believe and
7 that's, I think, why it is growing in its popularity
8 and its use.

9 Q. I want to ask you, Dr. Page, in the
10 little time I have left in terms of, you said
11 yesterday, and I think I have captured it, habitat
12 cannot be preserved it has been to be managed?

13 A. Yes.

14 Q. Managed in that -- we have all this
15 jargon in the hearing and when I hear the word manage I
16 think of it in terms of activities like accessing it,
17 harvesting it, renewing it and maintaining it.

18 Is it your understanding that any one or
19 all of those four activities are essential to the
20 management of habitat?

21 A. The point of this statement was that
22 the habitat cannot be assumed to continue to exist in
23 perpetuity, that the existence of it must be
24 reconfirmed.

25 Q. So you just can't sort of plan on --

1 and I think, Mr. Patch, you were talking about this,
2 you just can't plan on putting aside a piece of land
3 and saying there is our habitat because, in fact, it
4 may not be there in 50 years unless you manage it. Is
5 that fair enough to say, Mr. Patch?

6 MR. PATCH: A. It would depend on the
7 type of habitat and what your objectives were, again.

8 What I'm saying is in most forest
9 situations that stands will change in time.

10 Q. Right.

11 A. If you expect to set aside an area
12 and the type of structure of those forest stands to
13 remain exactly as it is now, for it to provide the same
14 habitat values is unrealistic.

15 Q. That's why you have to manage it; is
16 that correct, Dr. Page?

17 DR. PAGE: A. To project it into the
18 future and to manage if there is a change, yes.

19 Q. Okay. Dr. Thomas, your management
20 plans are done every 10 years; is that correct?

21 DR. THOMAS: A. The forest management
22 plans are scheduled for 10 years, yes.

23 Q. I am a little confused. I heard you
24 talk about timber management plans. Do you have
25 separate timber management plans?

1 A. We have a forest plan.

2 Q. Yes.

3 A. There is a plan how timber management
4 will proceed under that overall plan, but it does not
5 exist independently. In the timber management plan we
6 assume a lot of things are a byproduct of that which is
7 joint production functions of wildlife, for instance.

8 Q. So that timber management plan would
9 incorporate and be part of the working -- of the
10 overall objectives that are established in the forest
11 management plan?

12 A. Absolutely.

13 Q. All right.

14 Q. And that timber management plan deals
15 with -- does it deal with the activities I was talking
16 about with Dr. Page earlier, access, harvest, renewal
17 and maintenance?

18 A. Yes.

19 MR. CASSIDY: Excuse me for a minute,
20 Madam Chair.

21 Those are my questions. Thank you.

22 MADAM CHAIR: Thank you, Mr. Cassidy.

23 MR. FREIDIN: While I am getting ready
24 here, gentleman, your counsel will probably tell you
25 that I follow the adaptive management approach in terms

1 of laying out my cross-examination and it is far from
2 computerized, so just bear with me.

3 MR. MARTEL: It means it is subject to
4 change.

5 CROSS-EXAMINATION BY MR. FREIDIN:

6 Q. Dr. Page, you gave certain evidence
7 about the transferability of the HSA model which has
8 been developed in British Columbia and I believe that
9 one of your exhibits indicated the parameters that were
10 in fact analysed or taken into account when preparing
11 that model; is that correct?

12 DR. PAGE: A. Which exhibit are you
13 referring to?

14 Q. Well, do you recall? Is there a
15 particular exhibit which identifies the factors or
16 parameters which affect wildlife that were taken into
17 account for the purposes of developing your model?

18 A. Is this the one you are referring to?
19 (indicating)

20 Q. Does that do that? Does it identify
21 all parameters which were taken into account?

22 A. No.

23 Q. It doesn't. Which one are you
24 pointing to up there?

25 A. That was a summary of the overall

1 presentation. I don't recall any particular list of
2 all the parameters, just some of those that are
3 possible.

4 Q. All right. Is there a document that
5 in fact contains a list of the parameters which were
6 taken into account in preparing your HAP model?

7 A. Would you define parameters for me,
8 please? Information sources?

9 Q. Well, were there certain habitat
10 wildlife relationships that you had to look at in which
11 you worked into the model?

12 A. In my evidence-in-chief I tried to
13 identify the kinds of relationships in a generic sense
14 that are used in developing these models.

15 Q. All right. Could you just list those
16 for me again, please, the generic ones?

17 A. The idea that many animals require
18 more than one attribute; as an example food and cover.

19 Q. Yes?

20 A. That the animals needs can be met if
21 they can move between places that provide those two
22 attributes rather than having to meet those needs in a
23 single stand, a single location.

24 Q. Those are the two generic ones, then?

25 A. Food and cover are not generic. It

1 is just that there could be more than one requirement.

2 Q. All right. Whether they can move is
3 a generic sort of thing you look at?

4 A. Most animals can move.

5 Q. All right, you looked at that. What
6 else did you look at?

7 A. In our particular case, as I
8 mentioned, aspect and elevation were fairly critical.

9 Q. Yes. What else?

10 A. Fundamentally important to a timber
11 management plan is the age of the forest.

12 Q. What else?

13 A. We can go on at length.

14 Q. I want you to go on at length.

15 A. In terms of what we looked at, as I
16 said, we used an adaptive management approach where
17 factors are entered in and looked at and the
18 contribution is assessed. If the contribution is low
19 the factors are eliminated.

20 Q. I want you to list all those factors,
21 sir.

22 A. That could take a very long period of
23 time. As an example --

24 Q. Why? Why would it take a long period
25 of time?

1 A. All the factors that we looked at?

2 Q. Yes.

3 A. It's a very complicated world out
4 there. There's many factors that could be considered
5 and we were attempting to use our abilities and our
6 knowledge to select those that are most likely in our
7 judgment to be useful in a modelling exercise.

8 Q. For the purposes of determining your
9 model for the area -- this is the area in Vancouver
10 Island you were talking about?

11 A. In that particular case, yes.

12 Q. So there is no document that you can
13 refer me to that will list that for me? Could you do
14 -it over night?

15 A. Probably not, but...

16 Q. Too many?

17 A. No. I was hoping to hear Dr. Thomas'
18 talk. We are here as volunteers. We are on holidays
19 now as well.

20 I will make an attempt, though, if the
21 Board requires it; in other words, if it is beneficial
22 to the Board. As I said --

23 Q. Well, it would be beneficial to me.

24 A. I can list them generically. I
25 cannot list them specifically.

1 Q. All right. See if you can finish the
2 list of the generic ones.

3 A. The only other one which I say is the
4 extensive one is ecological information about the land
5 base.

6 Q. Now, do I take it from your evidence
7 in relation to each of those particular generic topics
8 there are a host of specific related topics that you
9 have to look at and consider to determine what
10 contribution it may have in terms of preparing your
11 model?

12 A. No, I think the premise is wrong that
13 they have to be looked at.

14 Q. Well, you did look at them, so let's
15 start -- am I correct that you looked at a whole host
16 of factors to determine their contribution and whether
17 they would get included in the model and, if so, how?

18 A. As an example of the kinds of factors
19 we looked at we were interested in looking at how much
20 food was produced. Food is composed -- does not exist.
21 It is composed of an array of species of plants.

22 Q. All right. What sort of things would
23 you look at in terms of that?

24 A. As I said, an array of species of
25 plants. That's why the list of the species of plants

1 that could provide deer food is extensive. We decided
2 to concentrate on a group of plants that we could
3 collectively call shrubs.

4 Q. Can you give me some sort of idea of
5 whether we are talking about a dozen factors you looked
6 at or you were looking at hundreds of factors or you
7 were looking at 50?

8 Give me some idea of the number of
9 factors that you considered for the purposes of
10 developing your HAP model?

11 A. We were trying and we did succeed in
12 developing a model that had essentially four factors
13 when it was finished.

14 Q. I don't want to know the number of
15 models -- or the number of factors that ended up in the
16 model that you produced. I want to know the number of
17 factors that you considered to develop the model.

18 A. That was neither -- a large number of
19 factors is not an objective nor a consequence. It just
20 is. We may have been able to do looking at only those
21 four factors.

22 Q. Well, that isn't what I asked you,
23 sir. I want to know -- you said that you looked at a
24 number of factors and there were so many that you can't
25 list them for me.

1 I want you to tell me, are we talking 10,
2 50, or a hundred or what are we talking about?

3 A. In the case of the list of plant
4 species there was potentially a very long list of plant
5 species for which data were available that we analysed
6 in the computer.

7 There is, as I said, no record, no paper
8 trail of all the analyses that were performed, only
9 those that were successful. The unsuccessful analyses
10 in our particular case were not of interest.

11 Q. You went through a bunch of analyses,
12 many of which were unsuccessful, as part of the process
13 of developing your model; is that correct?

14 A. Yes.

15 Q. And you can't tell me in a ballpark
16 whether we are talking about -- the number of factors
17 that you looked at. You said you looked at a hundred
18 plant species. What about these other factors? I
19 mean, what are the sorts of things you have to
20 consider?

21 A. It is an infinitely complicated
22 world. I identified essentially four classes of
23 factors of which there can be a wide array of subsets
24 that could be looked at.

25 In terms of the plant species, no, I do

1 not have that list and I couldn't reconstruct it. I am
2 not a botanist.

3 Q. Did you look at a wide range of
4 subsets in relation to each of the generic topics that
5 you have told me about?

6 A. No. In the case of aspect elevation
7 not at all.

8 Q. All right. Did you look at a wide
9 range of subsets in relation to any other matters?

10 A. In age class, as an example, we
11 assessed the validity of using a continuous description
12 of how old the forest was. In other words, is a 101
13 year old forest any different than a 100 year old
14 forest, and in the examples I used there we subset that
15 into just a few age classes for convenience. It seemed
16 to capture the information we needed.

17 Q. Did you consider climate?

18 A. Not in the sense of climate change.
19 That's a component of our ecological classification
20 system, though.

21 Q. But you looked at climate in terms of
22 its effect on the animals for the purpose of developing
23 your model?

24 A. Not other than the factors in the
25 model such as the impact of snow on the animals'

1 energetics and its requirement for cover in the winter
2 time and the clear impact of climate on vegetation.

3 MR. FREIDIN: One moment, please, Madam
4 Chair.

5 Madam Chair, I would like an undertaking
6 from this witness to provide me with the description of
7 the factors which were considered within each of the
8 generic topics that he discussed.

9 Putting it perhaps in his language, I
10 want to know what the particulars were of the wide
11 range of subsets which were considered.

12 MADAM CHAIR: Mr. Freidin, before the
13 Board would require the witness to do that, tell us
14 what the point is of this part of your
15 cross-examination?

16 MR. FREIDIN: I need that information to
17 assess -- I want to know what was done there, in
18 British Columbia. There are some suggestions that what
19 was done there perhaps be done here. There is
20 discussions of transferability.

21 For my purposes I need that information
22 to be able to assess this witness' evidence. If he
23 says that it is too lengthy and too complicated to do,
24 then maybe we will just leave it at that. If that's
25 his evidence maybe that will be good enough.

1 MADAM CHAIR: Well, I think Dr. Page's
2 evidence so far is that there isn't a paper trail. He
3 doesn't have a document and there is nothing in the
4 computer that would show all the analyses that were
5 done.

6 MR. FREIDIN: Why don't we just leave it
7 for now and I will think about it over night.

8 MADAM CHAIR: All right. Do you have
9 anything to add, Dr. Page?

10 I mean, obviously you are being asked,
11 what is there that you have done in British Columbia
12 that could be helpful in Ontario. Maybe nothing you
13 have done can be transferred.

14 MR. FREIDIN: That isn't what I asked
15 him.

16 MADAM CHAIR: Then what is your question
17 because the Board doesn't understand, Mr. Freidin.

18 MR. FREIDIN: I just want the information
19 I asked for.

20 MADAM CHAIR: Well, it has got to be
21 helpful to the Board.

22 MR. FREIDIN: It might be if I got it.

23 DR. PAGE: We recycle our computer
24 output. As I say, it no longer exists. These are
25 analyses that have been underway for many years.

1 MR. FREIDIN: Okay.

2 DR. THOMAS: Madam Chair, could I respond
3 for a second.

4 We explained the technique that's common
5 in science called Occam's Razor where you shave away
6 the extaneous and you boil things down to the point
7 where they count.

8 It is not really necessary for everybody
9 to shave through all of the same information. If the
10 technique is transferable, it is really of very little
11 interest of what the long list of things that have been
12 shaved awy are.

13 The people can look at the remnant and as
14 competent biologists can make up their minds whether
15 that are the appropriate variables. If not, through
16 their experience they have an ability to deal with the
17 appropriate variables. They probably know very closely
18 what they are and how they can be considered.

19 Going through -- in the model that we
20 used we have used things that we call surrogates. For
21 example, if one looked at food, we know from
22 technological information that particular ecotypes have
23 certain kinds of understory, certain plants are there,
24 we can anticipate from that what the yield per acre is,
25 stand size, how stands are arranged in space, distance

1 to water, the impact of roads, roads per square mile,
2 ecotype type which is a surrogate, stand structure
3 which is indeed a surrogate, special features such as
4 snags, cliffs, caves and talus that I described.

5 Each one of those specifically may not be
6 applicable. The general concept of the combination of
7 stand size, juxtaposition and yield by ecotype,
8 arrangement on the landscape and special features are
9 the general generic features.

10 Biologists in Germany, in India, in
11 British Columbia, in New Brunswick, in the habitat
12 analysis situation across the United States have not
13 been befuddled by the wide range of variability.

14 MR. FREIDIN: Q. Dr. Page, how long did
15 it take you to develop your HAP model?

16 DR. PAGE: A. The very first assessment
17 in the 1987 publication was something we undertook in
18 our spare time. It was a three-day intensive workshop
19 effort. It has been refined continually since.

20 Q. How long do it take you to develop
21 the first model that you have used in your research
22 area?

23 A. In my career?

24 Q. No, in your research area in British
25 Columbia where I understand this HAP model -- when I

1 talk about HAP model I am talking about the
2 black-tailed deer?

3 A. Mm-hmm.

4 Q. It's being used I guess
5 operationally, if I can use that, in the research area
6 that you are involved in in Vancouver Island?

7 A. Yes. As I said, the very first model
8 we undertook a three-day intense workshop and developed
9 a model which was useful and we used that to develop
10 what I called in my witness statement the 'proof of
11 concept' to demonstrate that with a very simple model
12 we could provide some information of value and benefit
13 to managers.

14 Q. All right.

15 A. Having been successful, that model
16 has been developed to the current time.

17 Q. All right. And the time you began
18 that with your three-day workshop until in fact you had
19 the 'proof of concept' was how many years?

20 A. 'Proof of concept' occurred in three
21 days. Once the concept had been proven and accepted
22 the model development in an adaptive management
23 framework is essentially ongoing. Application of the
24 model leads to results and data, they are then used to
25 evaluate the model.

1 Q. Did you start using the model
2 operationally after the three-day workshop?

3 A. No.

4 Q. When?

5 A. There were requests, as I mentioned,
6 from industry foresters almost immediately to use the
7 model.

8 First of all, we were concerned that
9 being crude it may not have been appropriate to incur
10 cost on industry if we didn't have any justification
11 for the benefits.

12 Second of all, the Ministry of
13 Environment at that time had no specific objectives for
14 deer habitat. So, in other words, if the model had
15 been applied there was no assessment of whether that
16 was a good or bad assessment.

17 Q. I understood you said in your
18 evidence that before you give it to the companies you
19 wanted to validate the model?

20 A. I am a scientist and I have to have
21 some fait in everything I do.

22 Q. That's why before you give it to the
23 companies it has to be validated?

24 A. We chose that. It doesn't have to
25 be, yes.

1 Q. All right, that's what you chose. I
2 understand that in terms of that validation you used
3 information that you had collected over the 10 years
4 study that you did on black-tailed deer and the
5 telemetry tool and that sort of thing; is that right?

6 A. In 1985 there was five years of study
7 included.

8 Q. How long was it between the time you
9 had your workshop and people said they would like to
10 use it and the time that you, in fact, developed it to
11 the point where you had felt it was not -- it had gone
12 beyond being too crude and you had validated it and
13 then you gave to it to people to use? What is the time
14 -frame?

15 A. Could you repeat the question,
16 please?

17 Q. The model eventually -- you said that
18 you had your workshop, you developed a very crude model
19 but you didn't want to give it to people because you
20 felt -- to the industry because you felt it might be
21 inappropriate.

22 You also indicated in your evidence that
23 you had to validate the model before you would give it
24 to the companies to use.

25 I want to know what was the time period

1 between the time you had your workshop and the time you
2 finally validated the model and said: Here you go,
3 company, start trying to use this model?

4 A. The question indicates a false
5 premise in relationship to the adaptive management
6 system. The validation began almost immediately and
7 will continue throughout the use of the model or as the
8 data, the results of the application of the model are
9 determined and feedback to --

10 Q. But there was some validation, some
11 level of validation that you felt was necessary before
12 you would give it to the companies to use; is that not
13 correct?

14 A. That's a personal judgment as a
15 scientist.

16 Q. But that's in fact what happened, is
17 it not, that it was not given to the companies until
18 there was some level of validation?

19 A. The companies haven't received it
20 yet.

21 Q. All right. So it is being used
22 solely on your research project at the moment?

23 A. I believe I mentioned that the
24 companies were unwilling to wait for the government to
25 finalize the research program and they have actually

1 undertaken -- Fletcher Challenge Canada in particular
2 has undertaken their own research program.

3 Q. Who?

4 A. Fletcher Challenge Canada.

5 Q. Is that a forest industry?

6 A. Yes, on southern Vancouver Island,
7 and they undertood their own research project and
8 developed their own system.

9 The habitat protection biologist within
10 the Ministry of the Environment are the prime users of
11 this tool, as I mentioned. We said it would be of
12 benefit to other users, but the Ministry of the
13 Environment -- it is up to them, they are not my
14 -ministry and I have no control over what they do. It
15 is up to them to decide when they are willing to
16 release it to other users, the specific formulation
17 that we have adopted.

18 Q. All right. Let's just then deal with
19 not when it was given to the companies because it
20 hasn't been.

21 When did you start using the model? You
22 had your workshop, when did you start making decisions
23 about what would actually happen out in the field on
24 your research area based on analysing the results of
25 applying your model?

1 A. To concur with Dr. Thomas, I am a
2 scientist and I don't make decisions.

3 Q. No, no, I just said when did you
4 start -- all right. I am not saying when you should
5 have. Do you know when you actually started to use
6 outputs of the model for the purposes of making
7 on-the-ground decisions in the research area?

8 A. Immediately, yes.

9 Q. Immediately. Right after the
10 workshop then, within a couple of days or a couple of
11 months?

12 A. In that case it was not yet winter.
13 The original model was only a winter model and so we
14 had to wait for winter.

15 Q. All right, thank you. Now, Dr. Page,
16 could you take out the witness statement, please.

17 A. Yes.

18 Q. Actually, just leave it there and
19 don't open it because I am going to ask you about
20 something different. It wasn't my intention.

21 A. I will move it...

22 Q. Okay. You indicated in your evidence
23 that the HAP model, you developed it to be used on a
24 watershed basis?

25 A. We suggest that's the most

1 appropriate level, yes.

2 Q. But has the model been developed to
3 be used on a watershed basis or does it really -- is
4 this designed to be used on any particular land base?

5 A. The model could be applied at other
6 scales at other sizes.

7 Q. Now, I think you indicated you
8 thought that the watershed was a good area for planning
9 because there was little migration beyond the
10 watershed?

11 A. In the case of black-tailed deer in
12 particular on Vancouver Island they tend not to migrate
13 over the height of land.

14 Q. And the height of land, we are
15 talking about mountains in that particular context?

16 A. Not always.

17 Q. If it is not a mountain, what do you
18 mean by height of land, then?

19 A. A mountain implies very steep slopes
20 and in British Columbia there is usually snow at the
21 top. At other place it's nothing more than a hill.
22 Animals tend to migrate -- move up and down a hillside.
23 Similar to moose.

24 Q. Now, in one of your interrogatory
25 responses you indicated that model deals with areas

1 between 11- and 50,000 hectares?

2 A. Which response is this?

3 Q. It is OFIA interrogatory 11(a). In
4 11(a) you were asked --

5 MADAM CHAIR: That's page 24.

6 DR. PAGE: I found it now.

7 MR. FREIDIN: Q. The question was:

8 "What size of scale of watershed was used
9 in the British Columbia programs?"

10 You said:

11 "The watershed size varies in the B.C.
12 programs between 11- and 50,000
13 hectares."

14 You talk about hardware and software and
15 say that:

16 "The scale of the planning exercise
17 should be tailored to an appropriate
18 level on a site-specific basis."

19 You also gave evidence that if the areas
20 were larger than that that you would have to break up
21 the areas for the model to be applied. That's what I
22 understood you to have said in your evidence-in-chief?

23 A. No, I think my point was that large
24 areas become more difficult to understand and it is a
25 matter of convenience to have appropriate sized

1 planning units that are useful to the manager. There
2 are no hard and fast rules.

3 Q. Using the model at that scale, the
4 11- to 50,000 hectares, that's where you are using --
5 you are able to do that with a P.C.?

6 A. Yes.

7 Q. If you wanted to manage an area of
8 500,000 hectares would you be able to do it on a P.C.?

9 A. There is no longer any real
10 technological limit. It would be inefficient to use a
11 relatively poorly powered machine to undertake -- and
12 apply it to a large area such as that.

13 Q. Is your answer yes, that you could
14 deal with an area 500,000 acres on a P.C. or you
15 couldn't?

16 A. I could walk home to Victoria but I
17 prefer to fly. It could be done on a P.C., yes, that
18 was my answer.

19 Q. Thank you very much.

20 MR. FREIDIN: Well, Madam Chair, this is
21 a convenient place to stop.

22 Seeing that these witnesses may not be
23 available for the full day tomorrow I would request
24 that we start at 8:30 tomorrow or earlier if possible.

25 MR. O'LEARY: Or shorten the lunch.

1 MR. FREIDIN: And maybe a shorter lunch,
2 but I would prefer not to continue now. It has been a
3 long day for everybody.

4 MADAM CHAIR: Your cross-examination, Mr.
5 Freidin, is planned to take how long?

6 MR. FREIDIN: Oh, it is hard for me to
7 guess, but it will end in time for Dr. Thomas and Mr.
8 Martel to leave and get their plane, but I can't say
9 with any assuredness I will be finished by noon.

10 MADAM CHAIR: How long will your
11 re-examination be, Mr. O'Leary?

12 MR. O'LEARY: Well, it is a little
13 difficult. To this point there is nothing. So right
14 now nothing.

15 I understand what he is saying that it
16 has been a long day, but if he thought he was at risk
17 of not completing it tomorrow so that Dr. Thomas could
18 get away we would be happy to stay on a little longer
19 now, but I am in your hands.

20 MADAM CHAIR: Well, certainly we will be
21 finished the cross-examination tomorrow and I think Mr.
22 Freidin just wants to give us a little margin at the
23 end of the day.

24 We will start at 8:30 tomorrow, Mr.
25 Freidin, and we have always been successful in turning

1 back your cross-examination under deadline, so I am
2 sure we will be tomorrow as well.

3 MR. FREIDIN: Okay.

4 MADAM CHAIR: Gentlemen, will that be
5 inconvenient for you to start at 8:30 tomorrow morning?

6 DR. THOMAS: No, ma'am. Whatever time
7 you choose.

8 MADAM CHAIR: Thank you for your
9 cooperation. We will start at 8:30 then.

10 MR. FREIDIN: I learned in this business
11 very early that people involved in natural resources
12 seem to get up with the sun.

13 DR. THOMAS: Yes. In fact, it is my
14 bedtime about now.

15 MADAM CHAIR: We will see you in the
16 morning then at 8:30.

17
18 ---Whereupon the hearing was adjourned at 4:00 p.m., to
19 be reconvened on Thursday, February 20, 1992
20 commencing at 8:30 a.m.

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23
24
25 MC [C. copyright 1985].



